IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

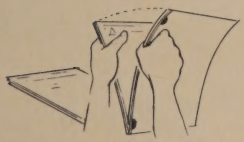
TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.



3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 516 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN. 1961

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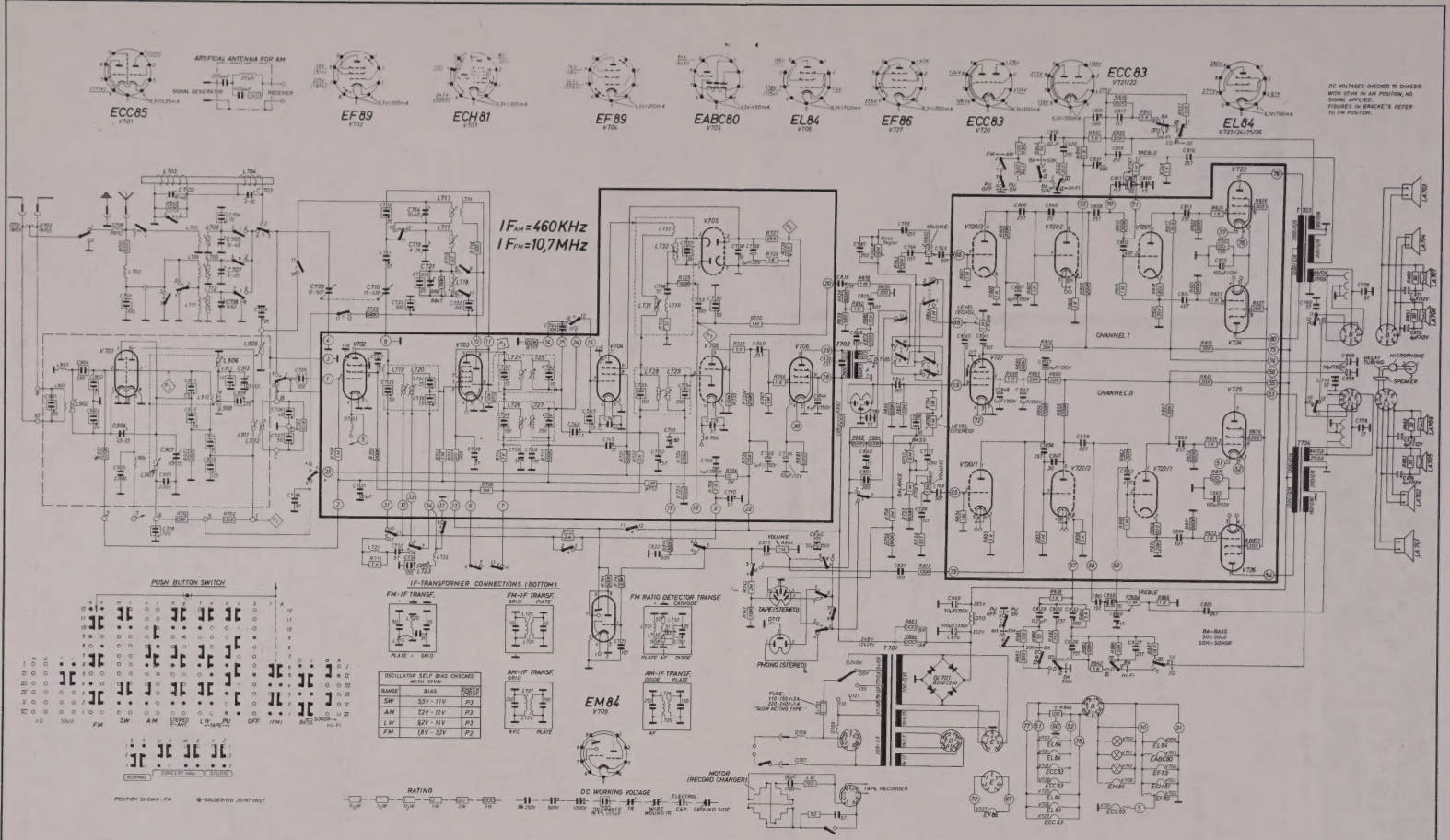
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

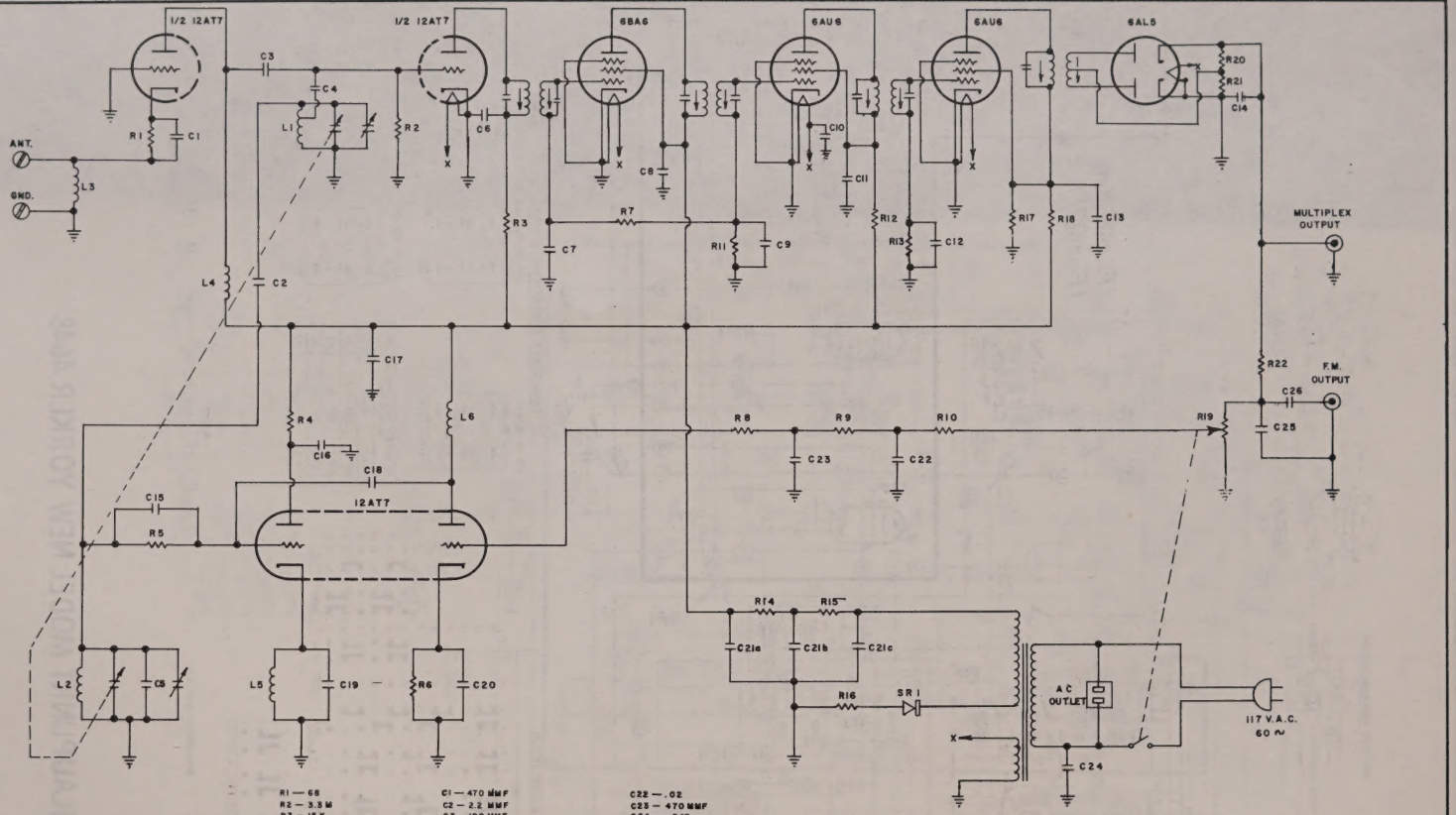
Bigg of California
Model FB-2M

Blaupunkt Model
New Yorker 4648



BLAUPUNKT MODEL NEW YORKER 4648

Schematic Diagram Courtesy of Blaupunkt: Importer N. Pickens Import Company



R1 — 68
R2 — 3.3 M
R3 — 15 K
R4 — 1 K
R5 — 10 K
R6 — 560
R7 — 3.3 M
R8 — 68
R9 — 470 K
R10 — 1 M
R11 — 100 K
R12 — 1 K
R13 — 100 K
R14 — 330
R15 — 330
R16 — 47
R17 — 15 K
R18 — 10 K
R19 — 1 M POT
R20 — 100 K
R21 — 100 K
R22 — 68 K

C1 — 470 MMF
C2 — 2.2 MMF
C3 — 100 MMF
C4 — .005
C5 — 5.6 MMF
C6 — .005
C7 — .02
C8 — .005
C9 — 100 MMF
C10 — .005
C11 — .005
C12 — 100 MMF
C13 — .005
C14 — 100 MMF
C15 — 100 MMF
C16 — 470 MMF
C17 — .005
C18 — 100 MMF
C19 — 10 MMF
C20 — 470 MMF
C21a — 40 x 150 V
b — 40 x 150 V
c — 30 x 150 V

C22 — .02
C23 — 470 MMF
C24 — .047
C25 — .001
C26 — .02
L1 — FM RF COIL
L2 — 3.3 μh RF CHOKE
L3 — DETECTOR COIL
L4 — F.M. OSC. COIL
L5 — 1 μh RF CHOKE
L6 — 3.3 μh RF CHOKE

NOTES: 1. ALL RESISTORS ARE 1/2 WATT
2. ALL CAPACITOR VALUES ARE MICRO-FARADS UNLESS OTHERWISE NOTED.

BIGG OF CALIFORNIA MODEL FB-2M

Schematic Diagram Courtesy of Bigg of California

PHOTOFACT® Folder

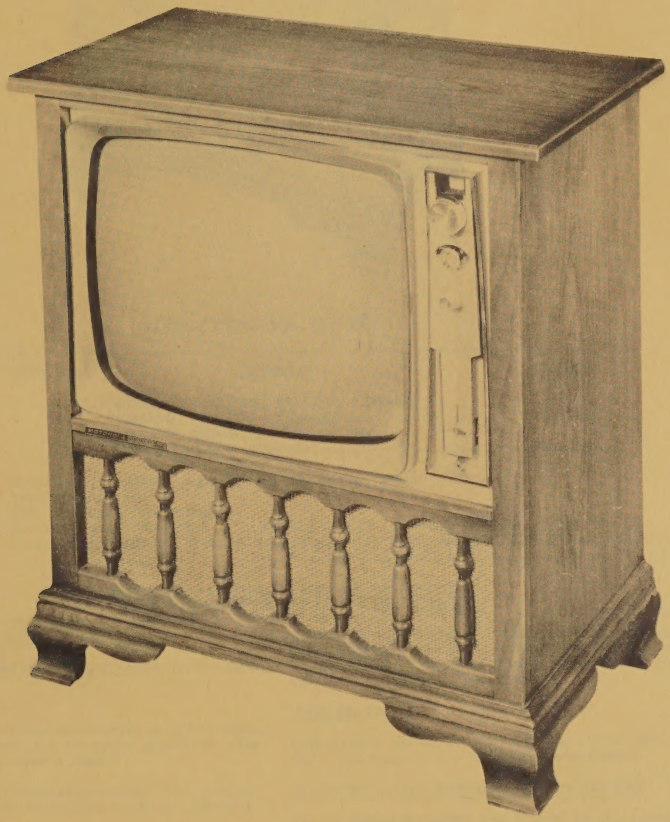
**MOTOROLA CHASSIS
VTS-569, VTS-569Y**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA CHASSIS
VTS-569, VTS-569Y

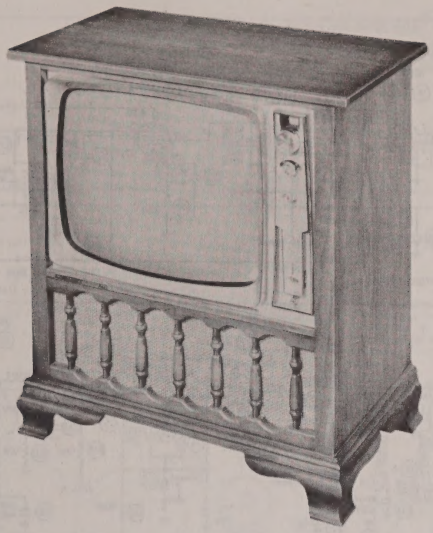


MODEL 23K40CW (CH. VTS-569)

MOTOROLA CHASSIS
VTS-569, VTS-569Y

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



MODEL 23K40CW (CH. VTS-569)

TRADE NAME	MOTOROLA	MODELS	CHASSIS
		Y23K40CW, Y23K41W, Y23K42W, Y23K43W, Y23K44W, Y23K45W, Y23K46MB	VTS-569Y
		23K40CW, 23K41W, 23K42W, 23K43W, 23K44W, 23K45W, 23K46MB	VTS-569
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF - Nineteen, UHF - Twenty		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	VHF - 220 Watts, 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE

A 5 Amp. (line) fuse is used for receiver protection and a ½ Amp. S/B fuse is used for LV supply protection. (For location, see "Tube Placement Chart").

A fuse wire is used for filament protection. (For location, see M5 "Chassis Bottom View-Capacitor & Misc. Ident.").

TUNER OSCILLATOR ADJUSTMENT

The VHF Oscillator may be touched up by removing control panel supporting tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to various voltage points (as indicated in photo "Cabinet - Rear View") to obtain best overall focus. Then adjust Focus Coil (L26 in photo "Chassis - Top View") for best focus on each side of raster.

SYNC STABILITY

Sync stability may be varied by means of a Noise Gate Control. (For location, see "Tube Placement Chart").

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart").

WIDTH

The width may be varied by a Horizontal Size Coil Slug (B1). (For location, see "Tube Placement Chart").

CENTERING

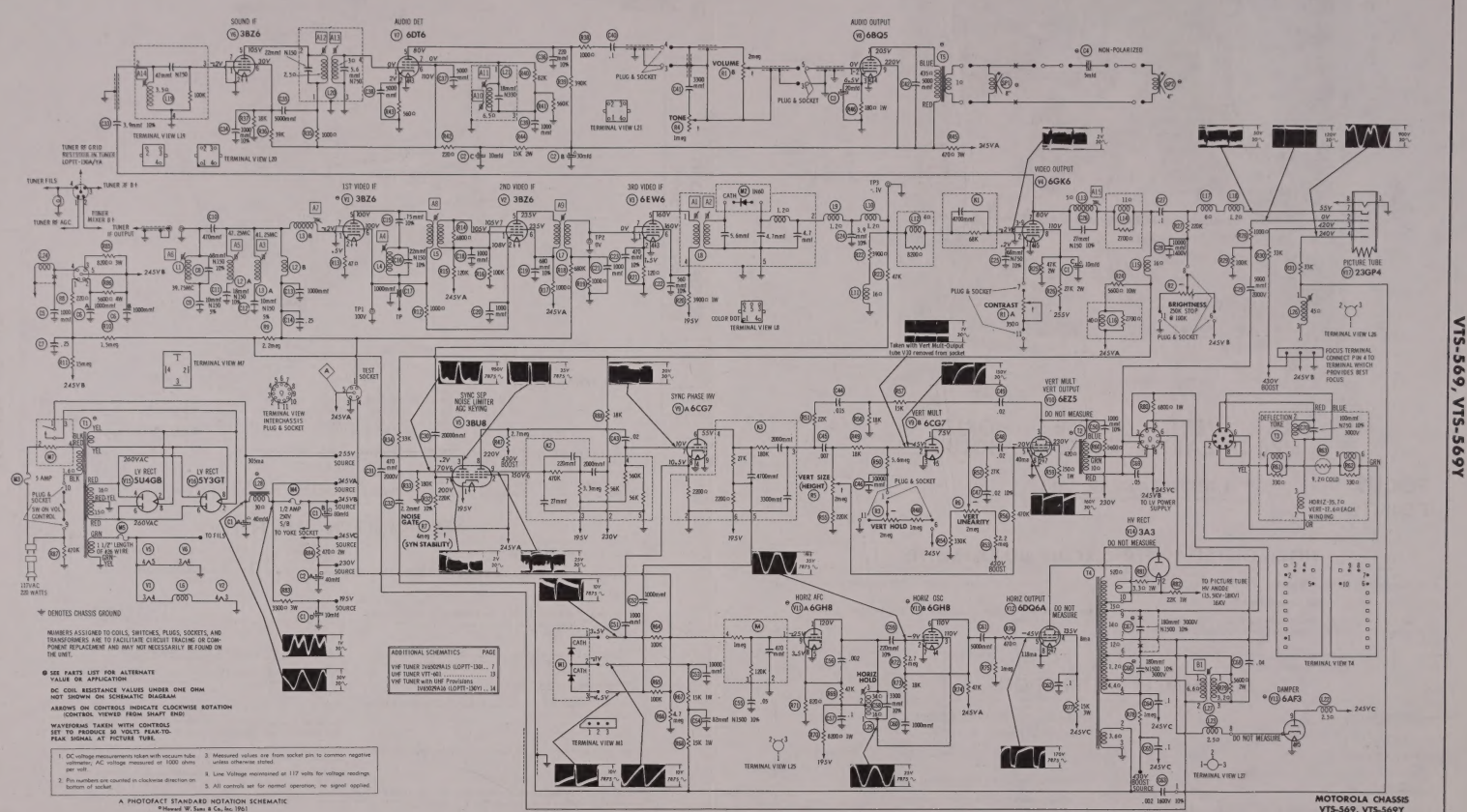
Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

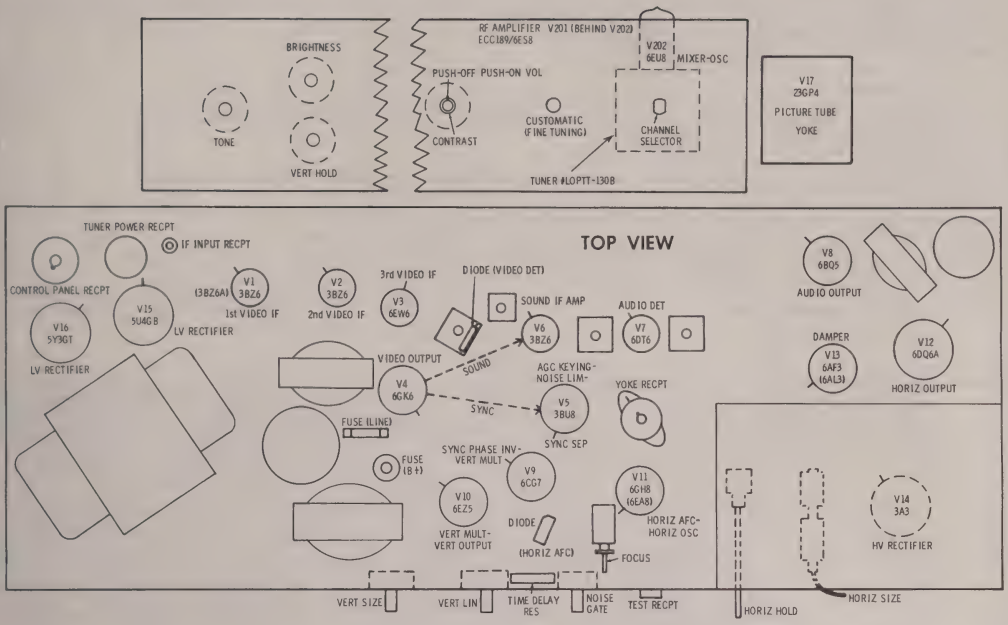
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

MOTOROLA CHASSIS
VTS-569, VTS-569Y

SET 516 FOLDER 1


SOUND IF
AUDIO DET
AUDIO OUTPUT
VOLUME
TONE
PLUG & SOCKET
TERMINAL VIEW L25
TERMINAL VIEW L20
TUNER RF GRID RESISTOR IN TUNER LOPTT-CHA/YA
TUNER FILS
TUNER RF AGC
TUNER IF OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO OUTPUT
COLOR DOT
TERMINAL VIEW L8
Taken with Vert Mult-Output tube V20 removed from socket
CONTRAST
BRIGHTNESS
PICTURE TUBE
TERMINAL VIEW L26
FOCUS TERMINAL CONNECT PIN 4 TO TERMINAL WHICH PROVIDES BEST FOCUS
TERMINAL VIEW M7
TEST SOCKET
TERMINAL VIEW INTERCHASSIS PLUG & SOCKET
SYNC SEP NOISE LIMITER AGC KEYING
SYNC PHASE INV
VERT MULT
VERT OUTPUT
DO NOT MEASURE
VERT SIZE (HEIGHT)
VERT HOLD
VERT LINEARITY
DEFLECTION YOKE
TO LV POWER SUPPLY
HV RECT
TO PICTURE TUBE HV ANODE (15, 16CV -18KV) 36KV
TERMINAL VIEW T4
LV RECT
I/O AMP
TO YOKE SOCKET
TO FILS
SW ON VOL CONTROL
PLUG & SOCKET
117VAC 220 WATTS
260VAC
DENOTES CHASSIS GROUND
NOISE GATE
(SYN STABILITY)
HORIZ AFC
HORIZ OSC
HORIZ OUTPUT
HORIZ HOLD
TERMINAL VIEW M3
TERMINAL VIEW L25
DAMPER
TERMINAL VIEW L27
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 1V600MA1S (LOPTT-130)... 7
VHF TUNER VTT-601 ... 13
VHF TUNER with UHF Provisions 1V600MA1S (LOPTT-130Y1)... 14
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
*Howard W. Sams & Co., Inc. 1961
MOTOROLA CHASSIS VTS-569, VTS-569Y

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), Fuse (B+), V15, V16

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V17
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15, V16
Vert. off freq. V9, V10
Horiz. off freq. Diodes (Horiz. Phase Det.), V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V9
No horiz. sync V5, V9
No vert. or horiz. sync V5, V9

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #9050L, 9150
WALSCO #2521

VIDEO IF ALIGNMENT

Remove the yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from point Ⓐ to Chassis. (CAUTION: Point Ⓐ has B plus voltage on it.)
Disable the tuner oscillator by grounding the grid (pin 2) of oscillator.
Set the Noise Gate Control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 6 volt bias supply to point Ⓑ. Positive to chassis.
Maintain between 2 and 5 volts peak to peak on the scope except where otherwise noted in the procedure.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp.)	45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. Load).	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3, A4	Increase scope gain. Remove bias if necessary. Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	39.75MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil & A7	Set scope for 3 volts peak to peak. Restore 6 volt bias. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affects the two outside peaks. Tune slugs at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8 to remove.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. Load).	A8, A9	Adjust A8 to place 42.25MC marker at 50% on curve as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A8 and A9 for correct response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for normal picture and sound.
Connect the DC probe of a VTVM to point Ⓐ. Common to chassis. Adjust A10 for maximum deflection choosing the one of two peaks that produce the highest voltage. While listening to the sound, retouch A10 for maximum sound with MINIMUM distortion.
The top slug (A11) is a preset slug which is set near the top of the coil form and left there.
Change to a very weak signal (this may be done by loosely coupling the antenna lead to the antenna terminals) that produces a hiss in the sound. Adjust A12 and A13 for maximum sound and MINIMUM distortion. Adjust A14 for maximum undistorted sound. If sound is not clear at this point, repeat the above procedure as necessary.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A15 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

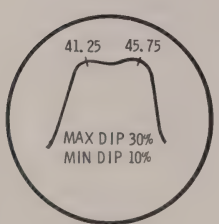


FIG. 1

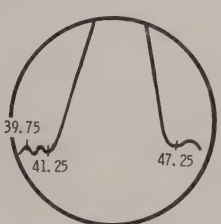
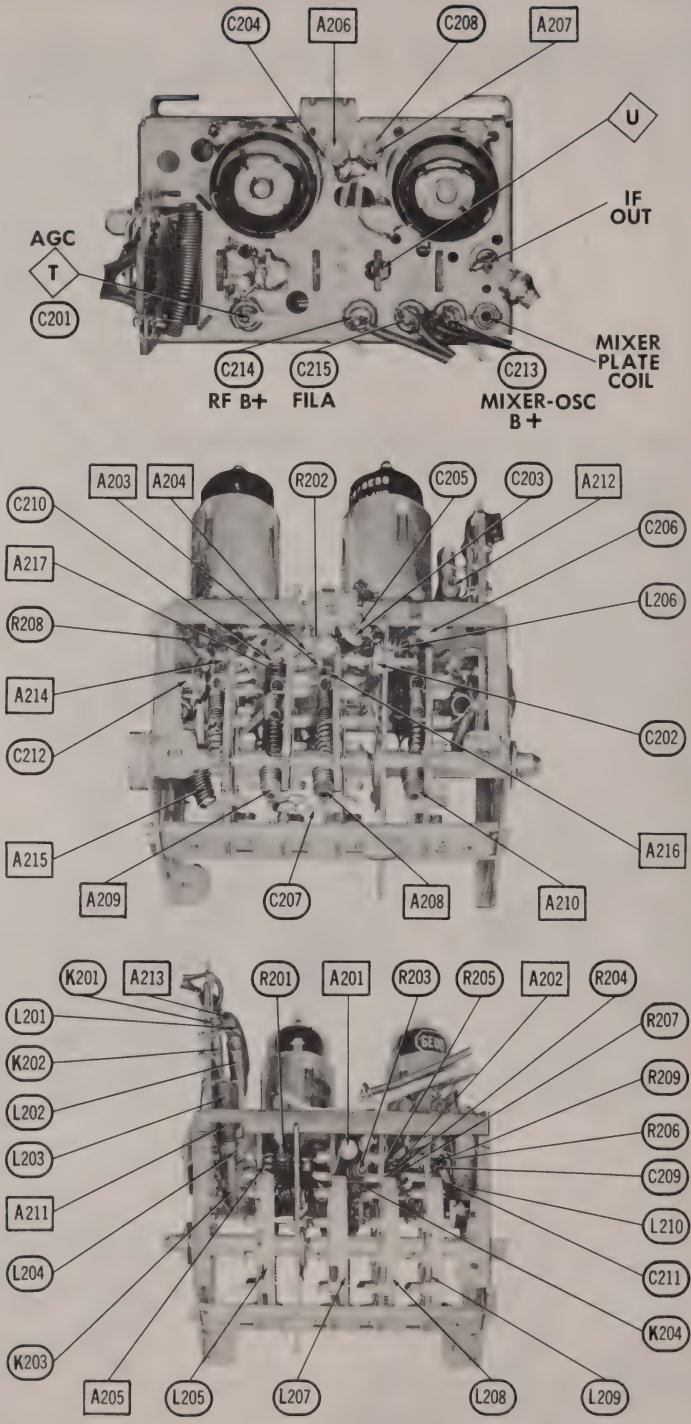


FIG. 2

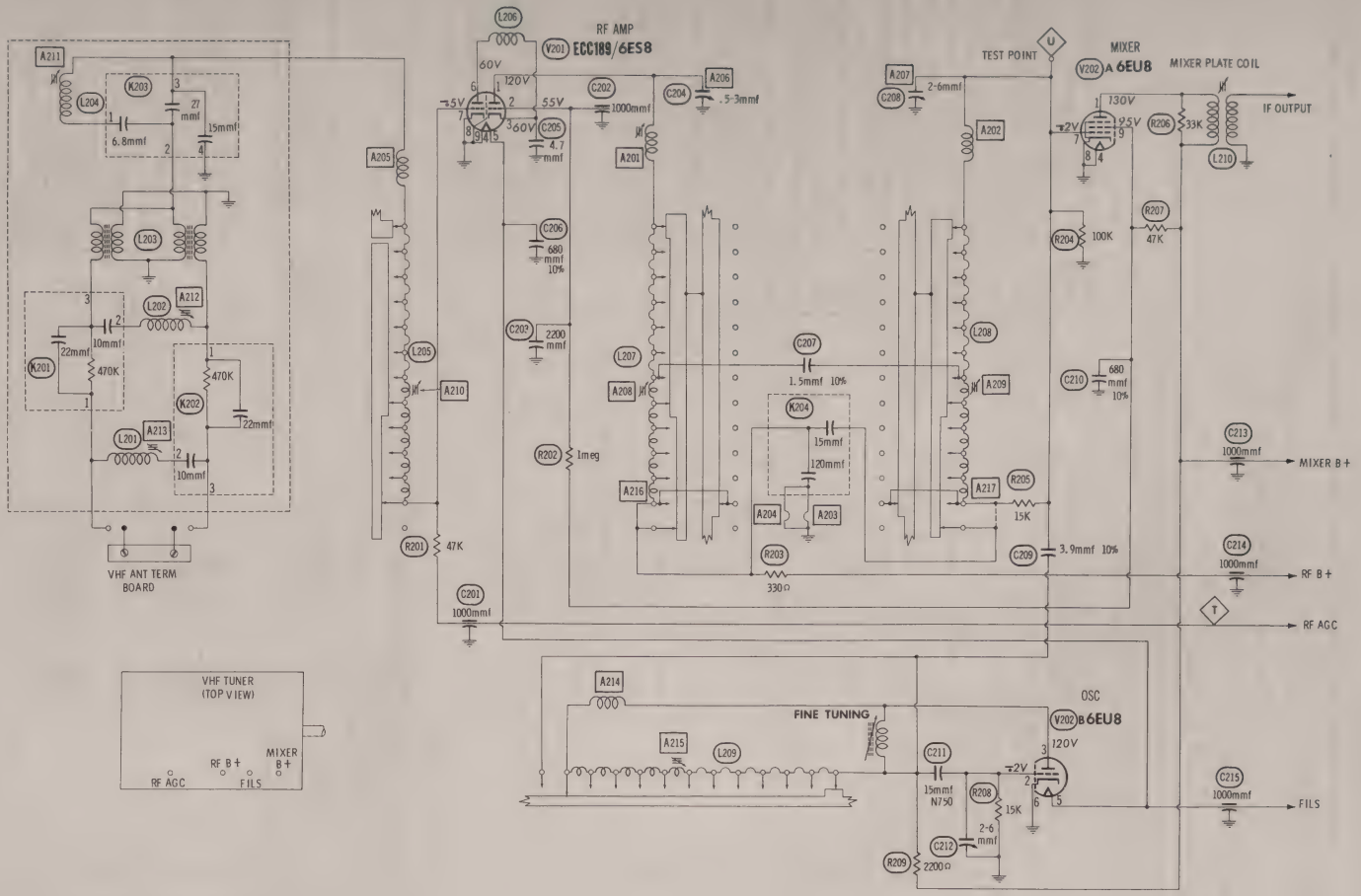
FIG. 3

FIG. 4

CHASSIS BOTTOM VIEW – RESISTOR & INDUCTOR IDENT.



VHF TUNER 1V65029A15 (LOPTT-130)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 1V65029A15 (LOPTT-130)

MOTOROLA CHASSIS
VTS-569, VTS-569Y

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Remove the deflection yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 3 to pin 5 of the Service Test Receptacle.
DO NOT remove the tuner cover.
Suggested Alignment Tools: A206, A207 ..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A208 thru A213... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point Ⓣ to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Preset A206 and A207 so top of screw is .35" above tuner chassis.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	"	"	"	"	A203, A204	Adjust for proper bandwidth as in Fig. 201.
3.	"	"	"	"	"	"	A205	Adjust for maximum amplitude and MINIMUM tilt.
4.	"	"	177MC	175.25MC 179.75MC	7	"	A206, A207	Adjust A206 for proper marker position. Adjust A207 for MINIMUM tilt.
5.	"	"	85MC	83.25MC 87.75MC	6	"	A208, A209, A210	Adjust A208 to place 83.25MC marker on or near peak, A209 to place 87.75MC marker on or near other peak and A210 for maximum gain and MINIMUM tilt.
6.	"	"	"	94MC	"	"	A211	Adjust for MINIMUM response at marker or until it just starts to affect the high frequency side of response curve. NOTE: A211 may be adjusted to trap out interference between 85 and 108MC. However, make certain that no part of a desired channel is trapped out.
7.	"	"	79MC	77.25MC 81.75MC	5	"		Check for response similar to Fig. 201. If necessary make compromise adjustment of A208, A209 and A210 for proper curve on each channel.
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			
8.	"	"	57MC	43.5MC 45.5MC	2	"	A212, A213	Adjust A212 for MINIMUM response at 43.5MC marker and A213 for MINIMUM response at 45.5MC marker. Retouch either or both for flat response consistent with MINIMUM amplitude at trap frequencies.

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A214	Adjust to place marker in trap notch as in Fig. 202.
10.	"	"	207MC	209.75MC	12	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A214 for all high band channels.
			201MC	203.75MC	11			
			195MC	197.75MC	10			
			189MC	191.75MC	9			
			183MC	185.75MC	8			
			177MC	179.75MC	7			
11.	"	"	85MC	87.75MC	6	"	A215	Adjust to place marker in trap notch as in Fig. 202.
12.	"	"	79MC	81.75MC	5	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A215 for all low band channels.
			69MC	71.75MC	4			
			63MC	65.75MC	3			
			57MC	59.75MC	2			

CONTINUED ON PAGE 13

TUNER PARTS LIST AND DESCRIPTIONS

LOPT1—130

TUBES

• GENERAL ELECTRIC •			RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	ECC189/6ES8	V202	Mixer - Osc.	6EU8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	1000		EF-001	MFT-1000		CCF-102	CT280A	
C202	1000		EF-001	MFT-1000		CCF-102	CT280A	
C203	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C204	.5-3			829-3		CV-1	CT565	
C205	4.7		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCU-V47
C206	680	10%	DI-680	DD-681		CCD-681	GP368	10TS-T68
C207	1.5	10%	NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C208	2-6			829-6		CV-3	CT552	
C209	3.9	10%			C10V4C			10TCC-V39
C210	680	10%	DI-680	DD-681		CCD-681	GP368	10TS-T68
C211	15	N750	N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C212	2-6			829-6		CV-3	CT552	
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R206	33K			
R202	1meg				R207	47K			
R203	330Ω				R208	15K			
R204	100K				R209	2200Ω			
R205	15K								

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	40KC Filter	10mmf, 22mmf, 470K	51C747535	Centralab PC-360
K202	40KC Filter	10mmf, 22mmf, 470K	51C747535	Centralab PC-360
K203	Antenna Input Coupling	6.8mmf, 15mmf, 27mmf	51K751641	Centralab PC-365
K204	RF Coupling	15mmf, 120mmf	51K752032	

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	40MC Trap	24K751665	
L202	40MC Trap	24K751665	
L203	Ant. Trans.	24C749398	
L204	RF Choke	24K752270	
L205	Ant. Coils	1V752397	Channel 2-13, Includes Wafer Assembly

ITEM No.	USE	MOTOROLA PART No.	NOTES
L206	RF Choke	24K752261	
L207	RF Coils	1V751663	Channel 2-13, Includes Wafer Assembly
L208	Mixer Grid Coils	1V751662	"
L209	Osc. Coils	1V65071A57	"
L210	Mixer Plate Coil	24B747838	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Arm and Gears	1V750041	Assembly, Fine Tuning, Includes Osc. Screw, Actuator, and Idler Gear
	Shaft	1K754160	Fine Tuning, Includes Nylon Driver Gear
	Shaft	1D65339A03	VHF Channel Selector, Includes Pre-Set Wheel

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	GENERAL ELECTRIC — USE	GENERAL ELECTRIC — TYPE	ITEM No	RAYTHEON — USE	RAYTHEON — TYPE	ITEM No	SYLVANIA — USE	SYLVANIA — TYPE
V1	1st Video IF Amp.	3DZ6 (3DZ6A) *	V9	Sync Phase Inv.- Vert. Mult.				
V2	2nd Video IF Amp.	3DZ6						
V3	3rd Video IF Amp.	6FW4	V10	Vert. Mult. - Vert. Output	6EZ5			
V4	Video Output	6GK6	V11	Horiz. AFC - Horiz. Osc.	6CH8 (6EA8) *			
V5	AGC Keying - Sync Sep. - Noise Limiter	3DU8	V12	Horiz. Output	6DQ6A			
V6	Sound IF Amp.	3DZ6	V13	Damper	6AF3 (6AL3) *			
V7	Audio Det.	6DT6	V14	HV Rectifier	8R5			
V8	Audio Output	6BQ6	V15	LV Rectifier	5U4GB			
			V16	LV Rectifier	5Y3GT			

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V17	23GP4			23CP4 ①		① Silver Screen "BS"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	400	23KT64185	AFH4-08	C2400	FP450	TMT-3738	TVLS-6851 *	
B	80	400			BR8045	TC77	TD-80-450		
C	10	400							
D	10	400							
C2A	40	400	23KT64190		B0410	FP259	TMD-3675	TVL-2757	
B	30	400			BR4048	TC78	TD-40-450	TVA-1713	
C	10	400							
C3	20	25	23KT39296	PRBL330	BBR30-25	TC46	TD-30-150	TVA-1305.5	
C4	30	150	23KT43970	PRBT400	BBR4-150	TC9304		TVAH3-1303.1* ①	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① May not be used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING			REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C6A	1000							CCD-102 ②		
B	1000				BPD-2X001	DD3-102	BYD6D01	CCD-102 ②	B2X210	5HK-2D10
C7	25	100V			P388N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P25
C8	68	N150	10%	Pt. #2R131232				*		10TCP-Q68
C9	10	N150	5%	Pt. #2R125698				*		10TCP-Q10
C10	470				BPD-00047	DD-471	BYAI0T47	CCD-471	B-347	10TS-T47
C11	18	N150	10%	Pt. #2R120578				*		10TCP-Q18
C12	10	N150	5%	Pt. #2R125698				*		10TCP-Q10
C13	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
	25	100V			P388N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P25
C15	75		10%	Pt. #2K735623				*		
C16	22	N150	10%	Pt. #2R120529				*		10TCP-Q22
C17	1000				EF-001	MFT-1000		CCF-102	CT280A	
C18	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C19	680		10%		DI-680	DD-681	5R5T68	CCD-681	GP368	10TS-T68
C20	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C21	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C22	560		10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C23	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C24	3-9		10%				C10V4C			10TCC-V39
C25	68	N750	10%		N750-DI 68	DTN-68	CUD6S6C	CCTN-680	CNT-468	10TCU-Q68
C26	27	N150	10%	Pt. #2R119896				*		10TCP-Q27
C27	1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C28	10000	1400V			DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
C29	5000	2000V				DD30-502	HVC20D5	3CCD-502	2HV-247	20HK-D5
C30	20000	2000			BPD-02	DD-203	BYB6B2	CCD-203	B-130	5HK-B20
C31	470	2000V			HVD-30-470	DD30-471	HVB20T47	3CCD-471	3HV-347	30GA-T47
C32	2.2		10%		VPO-SI 2.2	TCZ-2R2	C10V2ZC	CCTO-2R2	CWO-522	10TCC-V22
C33	3.9		10%				C10V4C			10TCC-V39
C34	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP310	10TS-D10
C35	5000				BPD-002	DD-502	BYAI0D5	CCD-502	B-250	5HK-D50
C36	220		10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C37	5000				BPD-005	DD-502	BYAI0D5	CCD-502	B-250	5HK-D50
C38	5000				BPD-005	DD-502	BYAI0D5	CCD-502	B-250	5HK-D50
C39	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C40	DF-104	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C41	3300				BPD-0033	DD-332	BYAI0D33	CCD-332	B-233	5HK-D33
C42	5000	2000V				DD30-502	HVC20D5	3CCD-502	2HV-247	20GA-D5
C43	02	600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-B20
C44	015	600V			P688N-015	DD-153	CUB6S3	6DP-2-153	GEM-615	6TM-B15
C45	007	600V			P688N-007	DD-683	CUB16D7	16DP-3-703	GEM-1627	MB-D7
C46	10000				BPD-01	DD-103	BYAI0S1	CCD-103	B-110	5HK-S10
C47	02	500V	10%		V84C82-10%		PM6S2	6DP-2-203	GEM-1612	6TM-S20
C48	02	600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-B20
C49	02	600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C50	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C51	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C52	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C53	1000				BPD-01	DD-103	BYAI0S1	CCD-103	B-110	5HK-S10
C54	.01	3000	10%	Pt. #2R131554				*		
C55	.05	200V			P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C56	.002	400V			P488N-002	DE-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C57	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C58	3300		10%		1469-0033		1R5D33	CM-20B-332K	MC2462	MS-233
C59	330		10%		DI-330	DD-331	L10T33	CCD-331	GP332	10TS-T33
C60	1000				BPD-001	DD-102	BYAI0D1	CCD-102	B-210	5HK-D10
C61	5000				BPD-005	DD-502	BYAI0D5	CCD-502	B-250	5HK-D50
C62	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C63	.1	1600V	10%				DPM3S6D2	16DP-2-302	GEM-1622	MB-D2
C64	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C65	.1	800V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C66	180	3000V	N1500	10% Note 1						
C67	180	3000V	N1500	10% Note 2						
C68	.04	400V			P488N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S40

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX* PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C69	05		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C70	100 3000V	N750 10%						

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Some versions use Simmd-5000V-N1500 in this application (Part #2R131507).
Note 2. Not used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	350Ω		#RD6S082A04	FI-1				
B	2meg			RP6-68			UE4201	Contrast
C	Switch			Not Req.				Volume
R2	250K		18KT53019	TT-40 ◆			TA184L	Push-Push Off-On
	100K Stop			*			*	Brightness
R3	2meg		18KT52020	TT-75 ◆			TA36L	Vert. Hold
R4	1meg	1/4	18KT54150					Tone
R5	2meg		18KT43523	TT-75	B47-2meg-S	KLC1	PTA36L	Vert. Size (Height)
R6	2meg		18KT43523	TT-75	B47-2meg-S	KLC1	PTA36L	Vert. Linearity
R7	4meg		18KT40694	TT-86	B47-4meg-S	KLC4	PTA56L	Noise Gate (Sync. Stability)

◆ Use part of original shaft and polyethylene tube.
* Use 100K Resistor in series with left hand terminal, viewed shaft end terminals down.
■ "STA-LOC" equivalent: FA35L1, RUP28A, OS1875A.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R8	220Ω			
R9	2.2meg			
R10	1.5meg			
R11	15meg			
R12	1000Ω			
R13	47Ω			
R14	6800Ω			
R15	120K			
R16	100K			
R17	1000Ω			
R18	680K			
R19	1000Ω			
R20	2000Ω 1W			
R21	120Ω			
R22	3300Ω			
R23	47K			
R24	5600Ω 10W	PW10-5600	10W-5Ω-5600	#17K747879
R25	47K 2W			
R26	27K 2W			
R27	220K			
R28	1000Ω			
R29	100K			
R30	33K			
R31	33K			
R32	220K			
R33	180K			
R34	33K			
R35	1000Ω			
R36	39K			
R37	18K			
R38	1000Ω			
R39	330K			
R40	82K			
R41	560K			
R42	220Ω			
R43	560Ω			
R44	15K 2W			
R45	470Ω 3W	PW3-470	5W-5Ω-500	#17K753483
R46	180Ω 1W			
R47	2.7meg			
R48	1meg			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R49	18K			
R50	5.6meg			
R51	22K			
R52	27K			
R53	2.2meg			
R54	330K			
R55	220K			
R56	470K			
R57	15K ①			
R58	18K			
R59	150Ω 1W			
R60	5600Ω			
R61	330Ω			
R62	330Ω			
R63	9.2Ω (Cold)			#6K746630
R64	100K			
R65	100K			
R66	4.7meg			
R67	15K 1W			
R68	15K			
R69	47K			
R70	8200Ω 1W			
R71	820Ω			
R72	2.7meg			
R73	18K			
R74	47K			
R75	1meg			
R76	470Ω			
R77	15K 3W	PW5-15K		#17K749181
R78	1meg			
R79	5600Ω 3W			
R80	6800Ω 1W			
R81	3.3Ω 1W			
R82	22K 1W			
R83	3300Ω 3W	PW5-3300		#17K753512
R84	470Ω 2W			
R85	8200Ω 3W	PW5-8200		#17K733283
R86	5600Ω 4W	PW5-5600		#17K753680
R87	470K			
R88	18K			

Motorola Part Number.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA	
K1	Video Output Grid	4700mmf, 6KV	51X744975		
K2	Sync Sep. Grid	27mmf, 220mmf, 2000mmf, 56K, 56K, 470K, 560K, 3.3meg	51J747693	Centralab	PC-358
				Sprague	HN-5
K3	Vert. Integrator	2000mmf, 3300mmf, 4700mmf, 2200Ω, 2200Ω, 27K, 180K	51D747379	Centralab	PC-355
K4	AFC Filter	470mmf, 120K, 1meg	51D65239A03		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	39.75MC Trap	24KT54048	TV-152	6225	RTC-8556	
L2A	47.25MC Trap	24KT54050				
B	Trap Coil					
L2A	41.25MC Trap	24KT47586				
B	1st Video IF					
L4	47.25MC Trap	24KT47585	TV-153 ▲	6225 ▲	RTC-8556 ▲	
L5	2nd Video IF	24KT47587	TV-130	6219	RTC-8551	
L6	Fil. Choke (1.3uh)	24KT30391	BC-562	4604	RTC-8516	

COILS (RF-IF) cont

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L7	3rd Video IF	24KT51249	TV-130	6219	RTC-8551	
L8A	4th Video IF	24KT50722 ①				▲ Disregard Tap
B	Resonant (8.5uh)	24RH1889				* Parallel with 8200Ω Resistor.
L8B	RF Choke (1.8uh)	24KT49772 ②	BC-562	9310-18	RTC-8518	▲ Parallel with 2700Ω Resistor.
L9	Resonant (8.5uh)	24RH1889				
L11	Peaking (500uh)	24CT49508	TV-203	6174	RTC-8592	1 Includes Complete Assembly.
L12	Peaking (100uh)	24KT54220 ③	TV-194 *	6112 *	RTC-8574 *	2 IRC Part #CLA.
L13	4.5MC Trap	24KT49390	TV-151 ▲	1469 ▲	RTC-8602 ▲	3 Includes 8200Ω Resistor.
L14	Peaking (240uh)	24KT52963 ④	TV-195 ▲	8181 ▲	RTC-8598 ▲	4 Includes 2700Ω Resistor.
L15	Peaking (500uh)	24CT49508	TV-203	6174	RTC-8592	
L16	Peaking (1400uh)	24KT49668 ⑤	BC-514 ▲	4064 ▲	RTC-8533 ▲	
L17	Peaking (180uh)	24KT49674	TV-194	6112	RTC-8574	
L18	Resonant (8.5uh)	24RH1889				
L19	1st Sound IF	24KT54052	TV-154	1470-A	RTC-8604	
L20	2nd Sound IF	24KT54051	TV-153	6203	RTC-8545	
L21	Quadrature	24KT51492	TV-154	1481	RTC-8606	
L22	RF Choke (7.5uh)	24KT47171	BC-565	4611	RTC-8521	
L23	RF Choke (7.5uh)	24KT47171	BC-565	4611	RTC-8521	
L24	Fil. Choke (1.5uh)	24KT42781	BC-562	4604	RTC-8516	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	Horiz. Osc.	24CT46779	TV-159	6211		RTC-8633	HS-7	
L26	Focus Coil	24CS5698A01						
L27	Horiz. Size	24KT54299						

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 100 Ma.)	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L28	.300A	30Ω	.92 Hy.	25KT51752AY ①	C-2996	C-2343	36C93	C-34X	① Alternate Part #25KT51752.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ① 1.9A	530VCT ② 309A DC	5V ③ 5A	25KT54167 ①					① Alternate Part #2KT54116.
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ④ 8.5A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	25KT46756-AK	A-2854	VO-34 ①		26S83 ②	A-116X ③	
T3	Alt. Vert. Output	25KT46756						
	Yoke (Horiz. 18.83mH) 110° (Vert. 30MH)	24KT54300 ④		DCM-1834 ④ ⑤		Y-53 ④ ⑤ ⑥	Y-52-1 ⑦	
T4	Alt. Yoke	24D65401A01						
	Horiz. Output							

① Connect as autoformer.
② Cut and tape red/yellow lead.
③ Use 8 to 1 Turns Ratio.
④ Use original yoke damping network if necessary.
⑤ Requires new rear cover and centering device.
⑥ Remove 27mmf capacitor across Terminals #2 and #7.
⑦ Use original vert. damping network if necessary.
⑧ Includes cable and plug.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	5000Ω	6-8Ω	25KT49146D ①	A-2902	A-3337	34S64	S-53X	① Alternate Part #25KT49146.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	50KT53031 ①	8A3IZ8	① Used in Models 23K40CW, Y23K40CW, 23K42W, Y23K42W.
SP2	4"	PM	6-8Ω	(50D6507A03)	4A3IZ8	
				1 2 3 4		② Used in Models 23K41W, Y23K41W.
	6" x 9"	PM	6-8Ω	50KT49581 ②	6	③ Used in Models 23K43W, Y23K43W, 23K44W, Y23K44W.
	5"	PM	6-8Ω	50KT49580 ③	5	④ Used in Models 23K45W, Y23K45W, 23K46MB, Y23K46MB.
	8"	PM	6-8Ω	50KT49397 ④	8A3IZ8.7	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1	IRC	48KT54153 *	6GD1 *			* Dual Sel. Diode (Series Connected)
M2	1N60	48KT47548		1N60	1N60	Video Det. (Chip-in)

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	5A 250V	65A742612	31A737466	312005 (3AG 5A 250V)	357001	MTH5	4405
M4	N	1½A 250V S/B	65K751794	9K750575	333.500 (N ½A 250V S/B)	346009	N ½	HN ½ to 3/4
M5	1½" length #26 wire							

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M6	Tuner	1V65029A15	(LOPTT-130) VHF, Chassis VTS-569
	Tuner	1V65029A16	(LOPTT-130Y) VHF with UHF Provisions, Complete, Includes Tubes, and Hi-pass Filter Ass'y., Chassis VTS-569Y
	Tuner		(VTT-601) UHF
M7	Thermostat Ass'y.	6C746780	Includes Time Delay Resistor and Thermal Switch

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

		Z3K40CW	Y23K40CW	Z3K41W	Y23K41W	Z3K42W	Y23K42W	Z3K43W	Y23K43W	Z3K44W	Y23K44W	Z3K45W	Y23K45W	Z3K46MB	Y23K46MB
Channel Indicator Window	61A748191	X	X	X	X	X	X	X	X	X	X	X	X	X	X
" " Mask	13A248192	X	X												
" " "	13A748192			X	X	X	X	X	X	X	X	X	X	X	X
Picture Tube Mask	13K754238	X	X	X	X										
" " "	13F754236					X	X								
" " "	13K754238							X	X	X	X				
" " "	13F754236											X	X	X	X
Knob-VHF Channel Selector	36C65264A01	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-UHF " "	36C65264A03		X		X		X		X		X		X		X
Knob-Fine Tuning	36C65263A01	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-UHF Indicator	34C65318A01		X		X				X		X		X		X
Knob- " "	24C65318A01						X								
Knob-Volume	36D65261A03	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Contrast	36D65262A01	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Brightness, Vert. Hold	36B751755	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Tone	36C65483A02	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Knob-Decorative	13K753282					X	X								
Cabinet	16E752447	X	X												
Cabinet	16E752372			X	X										
Cabinet	16E65359A01					X	X								
Cabinet	16E751875							X	X						
Cabinet	16E751904									X	X				
Cabinet	16E65354A01											X	X		
Cabinet	16E65357A01													X	X
Door Pull	16K749777											X	X		
Cabinet Leg	16K749075							X	X						

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Remove the UHF Tuner from the side of the VHF Tuner so that UHF input receptacle of VHF Tuner is accessible. Coils are accessible thru opening in the side of tuner.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Fig. 203	High side thru matching network to UHF input receptacle. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point ⓤ. Low side to chassis.	A216, A217	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.

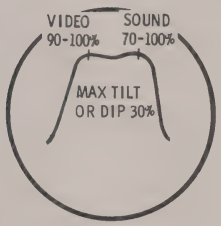


FIG. 201

FIG. 202

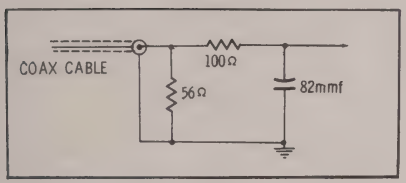
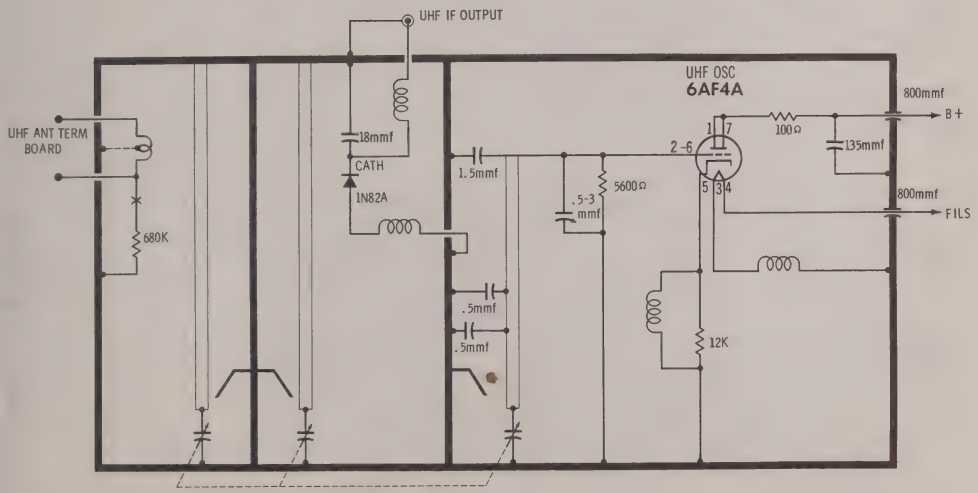


FIG. 203

FIG. 204



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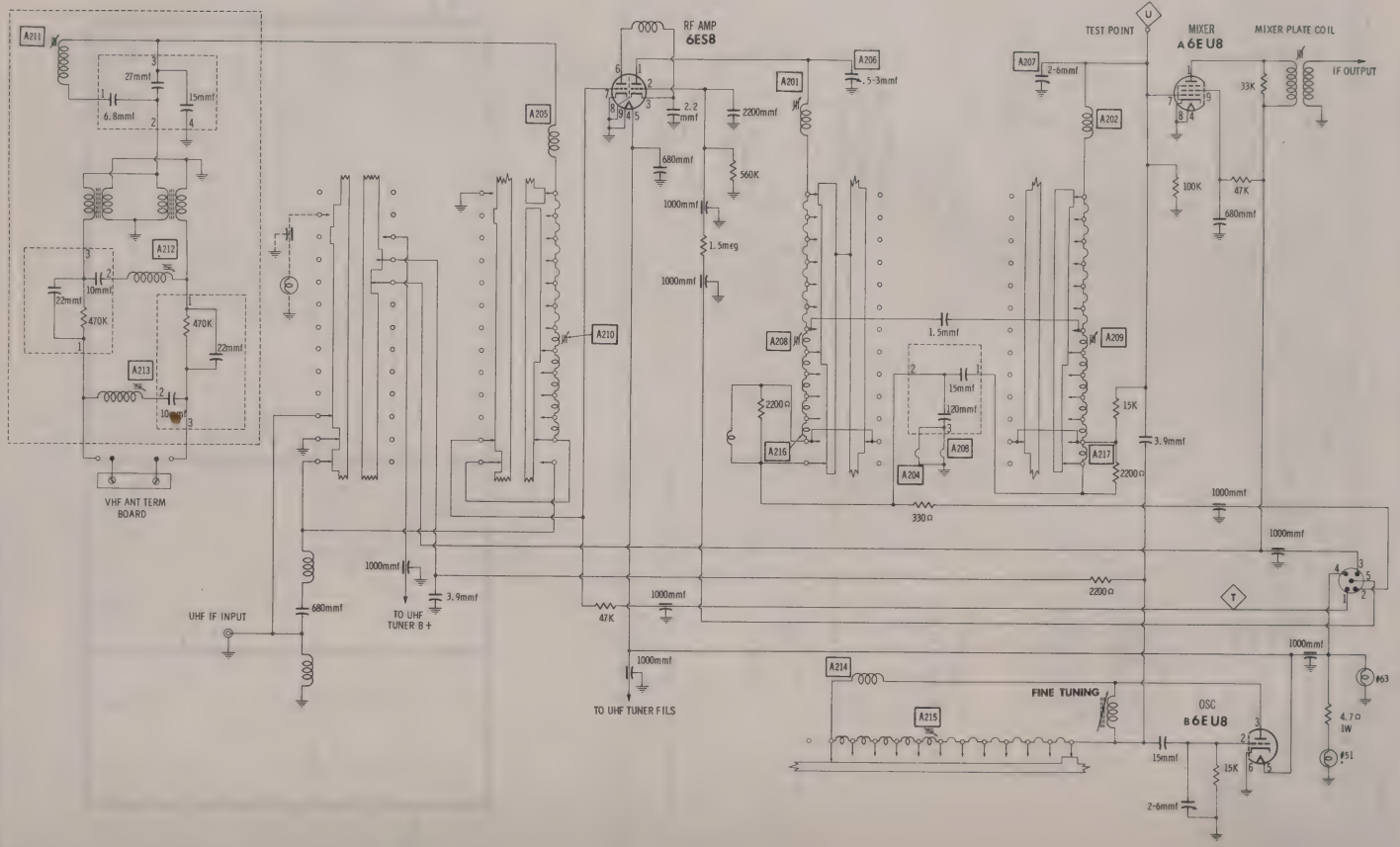
UHF TUNER VTT-601



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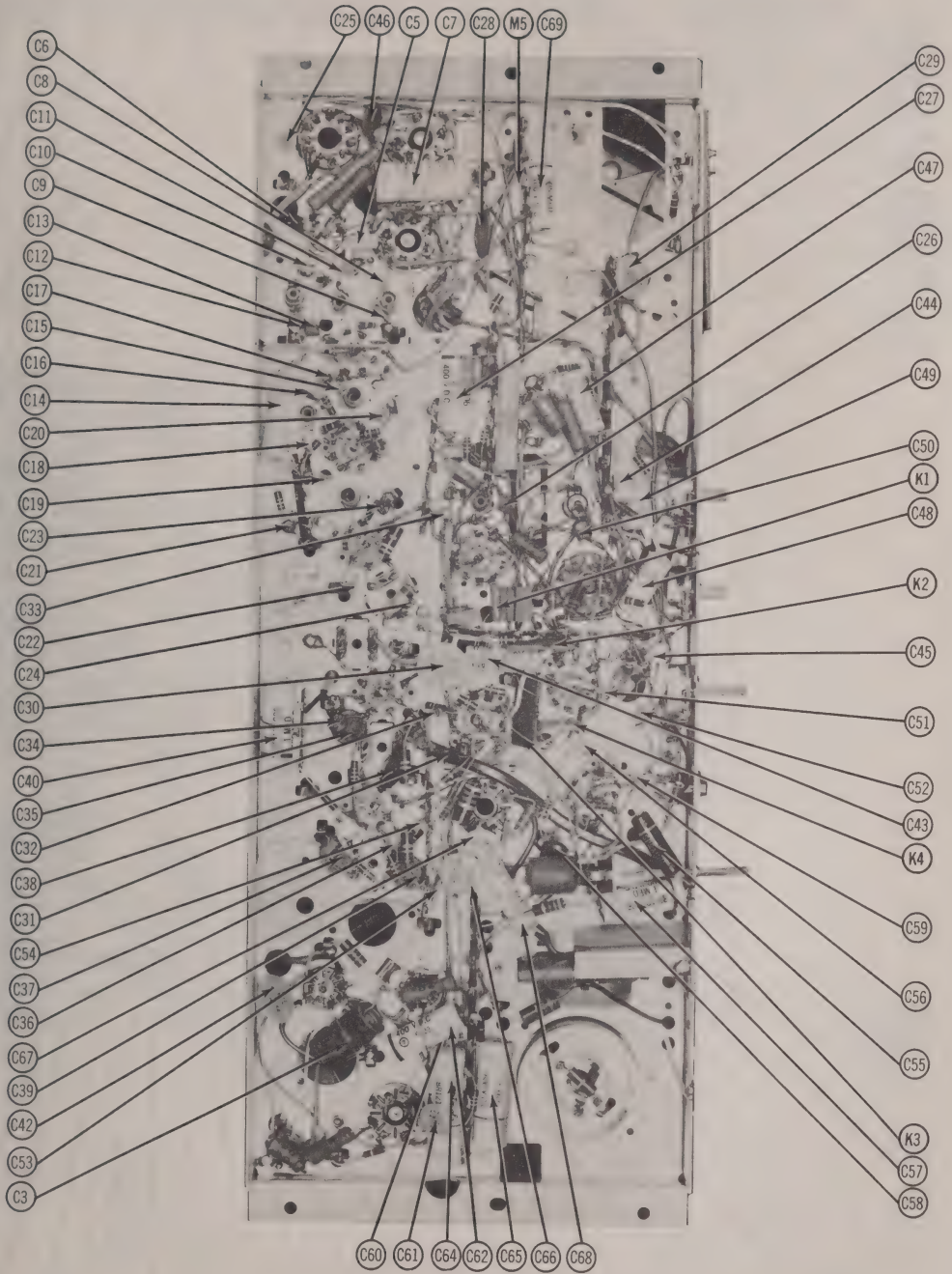
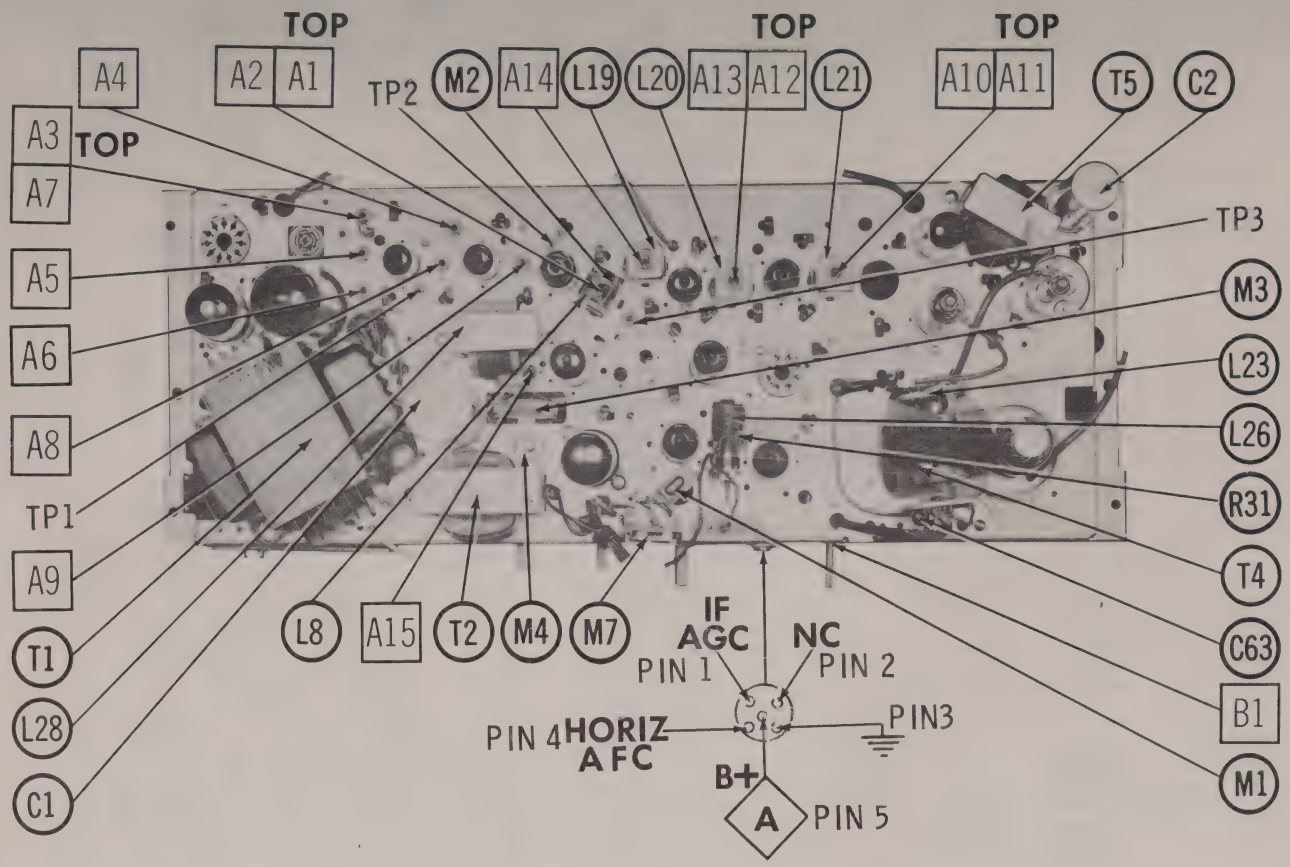
VHF TUNER with UHF Provisions - 1V65029A16 (LOPTT-130Y)



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



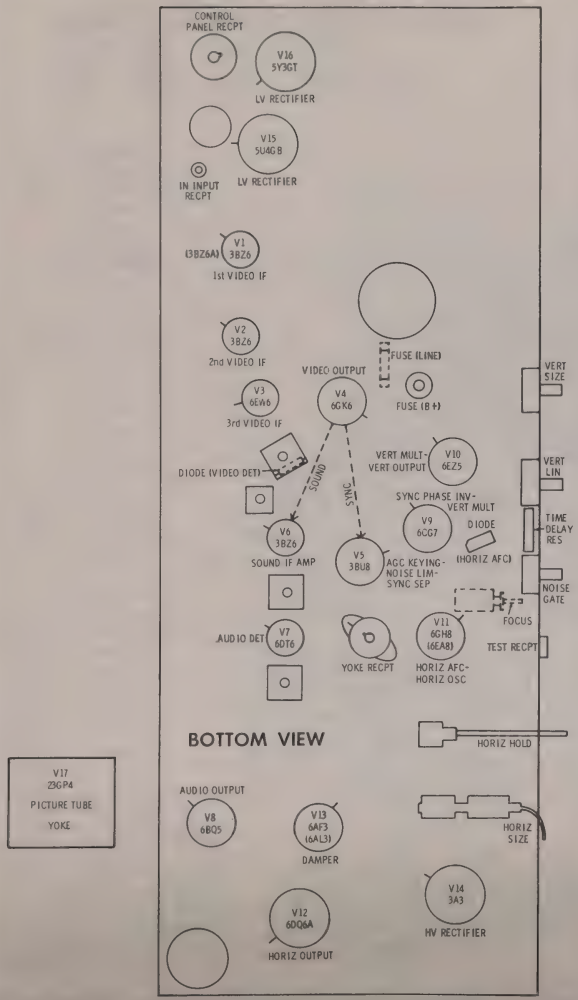
TP1 100V 1st IF SCREEN
TP2 0V 3rd IF GRID
TP3 -.1V VIDEO DET OUTPUT

PIN 1 -.2V PIN 4 -.4V
PIN 2 NC PIN 5 245V
PIN 3 GND

CHASSIS - TOP VIEW

MOTOROLA CHASSIS
VTS-569, VTS-569Y

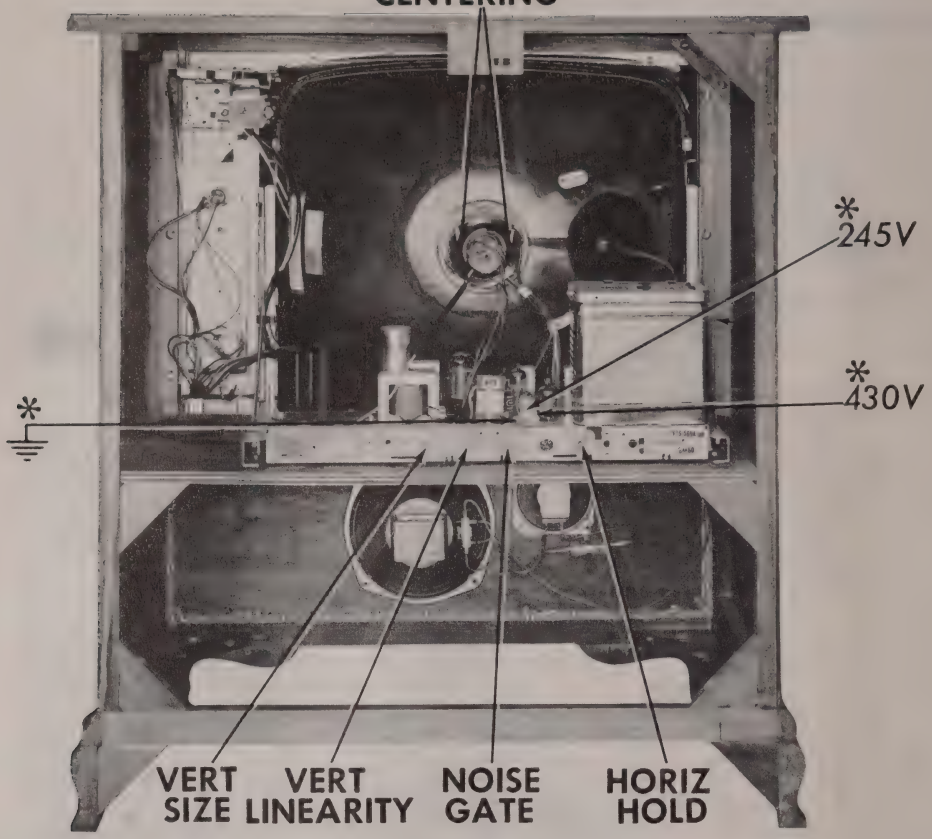
TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	680K	47Ω	.1Ω	.1Ω	▲1000Ω	▲1000Ω	0Ω		
V2	3BZ6	†65K	INF	0Ω	.1Ω	†1000Ω	†1000Ω	†65K		
V3	6EW6	1000Ω	120Ω	.1Ω	0Ω	†7200Ω	†7200Ω	0Ω		
V4	6GK6	● 60Ω	72K	0Ω	0Ω	.1Ω	NC	†5600Ω	†20K	0Ω
V5	3BU8	†3300Ω	†30Ω	2.9meg	.1Ω	.1Ω	†39K	●†220K	†3.7meg	†3.8meg
V6	3BZ6	100K	0Ω	.1Ω	0Ω	†17K	†20K	0Ω		
V7	6DT6	3Ω	560Ω	.1Ω	0Ω	†390K	†16K	560K		
V8	6BQ5	NC	● 0Ω	180Ω	.1Ω	0Ω	NC	†935Ω	NC	†500Ω
V9	6CG7	● †4.8meg	● 1.8meg	0Ω	0Ω	.1Ω	†33K	56K	2200Ω	0Ω
V10	6EZ5	TP	0Ω	†920Ω	†650Ω	●1.3meg	NC	.1Ω	0Ω	
V11	6GH8	†11K	†2.7meg	†11K	.1Ω	0Ω	†47K	0Ω	820Ω	5.7meg
V12	6DQ6A	TP	0Ω	NC	†15K	1meg	TP	.1Ω	0Ω	TOP CAP †31Ω
V13	6AF3	NC	NC	NC	0Ω	.1Ω	TP	TP	NC	†32Ω TOP CAP ¶
V14	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †550Ω
V15	5U4GB	TP	¶	TP	16Ω	NC	15Ω	NC	¶	
V16	5Y3GT	TP	¶	NC	16Ω	NC	15Ω	NC	¶	
V17	23GP4	0Ω	100K	† 1meg	†33K	NC	NC	● 250K	.1Ω	
V201	ECC189 6ES8	†6000Ω	†1meg	INF	0Ω	.1Ω	■0Ω	3.8meg	0Ω	0Ω
V202	6EU8	†8200Ω	15K	†10K	0Ω	.1Ω	0Ω	100K	0Ω	†55K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 2 OF V2.
■ MEASURED FROM PIN 3 OF V201.
NC NO CONNECTION
† MEASURED FROM 255V SOURCE.
† MEASURED FROM CAP OF V13.
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast Controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Adjust Width Slug (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 11 wood screws holding rear cover.
2. Remove rear cover.
3. Remove 3 plugs from control panel to chassis.
4. Remove speaker leads.
5. Remove yoke plug, picture tube socket, and high voltage lead.
6. Remove 4 chassis bolts.
7. Remove chassis.

PICTURE TUBE REMOVAL

See "Chassis and Picture Tube Assembly Removal".

CHASSIS AND PICTURE TUBE ASSEMBLY REMOVAL

1. Remove rear cover.
2. Remove 3 plugs from control panel to chassis and remove speaker leads.
3. Remove 4 chassis bolts from bottom of cabinet.
4. Remove chassis and picture tube assembly.

CONTROL PANEL REMOVAL

1. Remove knobs from front.
2. Remove 3 plugs to chassis.
3. Remove 2 screws at bottom and 1 at top (inside cabinet).
4. Remove panel.

PHOTOFACT® Folder

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

MODEL 23MT6055M (CH. 1150-80)

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SET 516 FOLDER 2

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

MODEL 23MT6055M (Ch. 1150-80)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	TRAV-LER	MODELS	CHASSIS
		17P6008	1150-89
		17P6015	1156-89
		23K6077B, 23K6077M, 23MT6055B, 23MT6055M	1150-80
MANUFACTURER	Trav-Ler Radio and Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF - Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 145 Watts, 1.4 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

In 23" Models, the safety glass is an integral part of the picture tube.

FUSE DEVICE

A fusible resistor is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug, is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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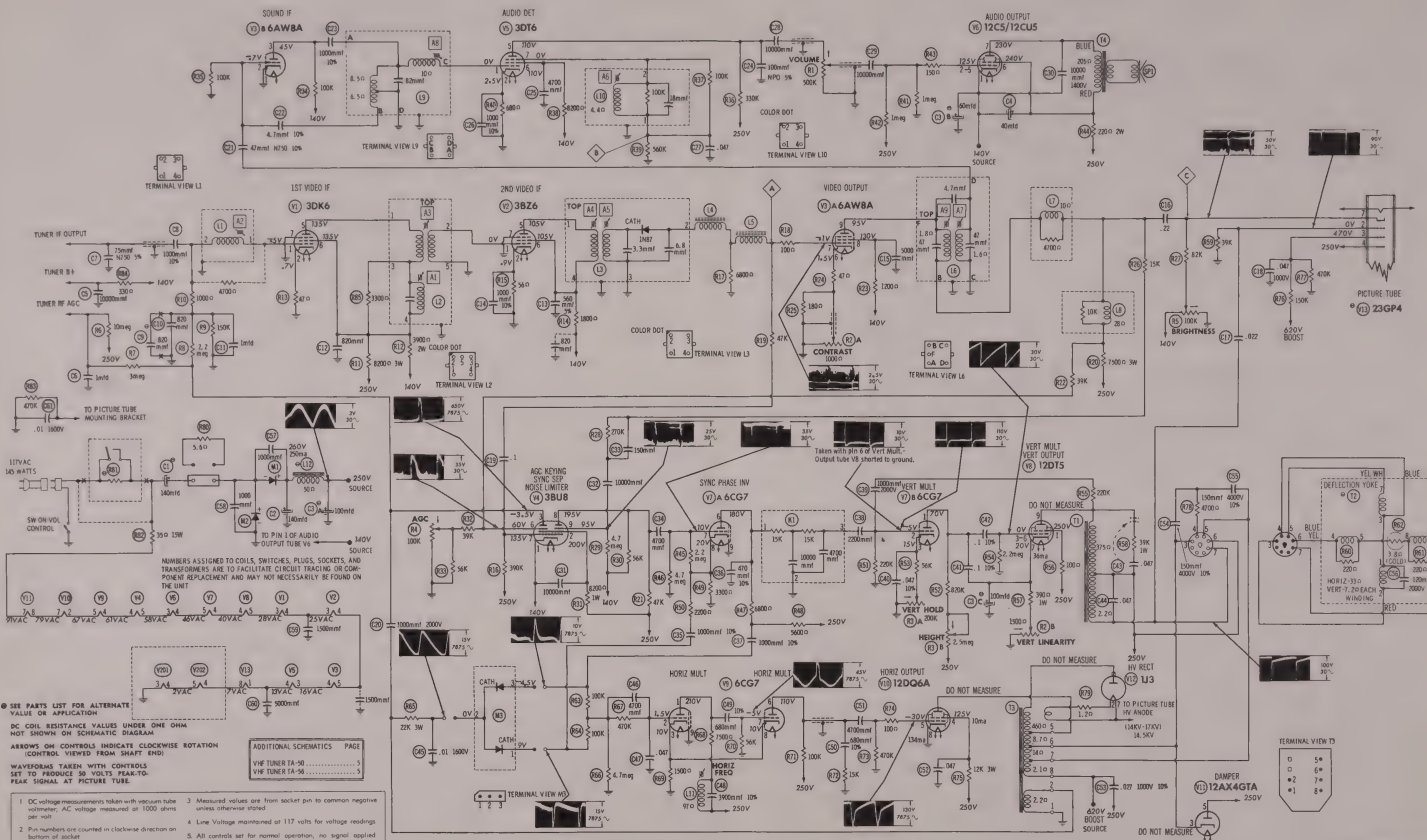
KA435

SET 516 FOLDER 2


SOUND IF
V2 a 6AW8A
AUDIO DET
V5 3DT6
AUDIO OUTPUT
V8 12C5/12CU5
VOLUME
COLOR DOT
TERMINAL VIEW L1
TERMINAL VIEW L9
TERMINAL VIEW L10
1ST VIDEO IF
V1 3DK6
2ND VIDEO IF
V3 3BZ6
VIDEO OUTPUT
V4 A6AW8A
TUNER IF OUTPUT
TUNER B+
TUNER RF AGC
COLOR DOT
TERMINAL VIEW L3
TERMINAL VIEW L2
TERMINAL VIEW L6
CONTRAST
BRIGHTNESS
620V BOOST
PICTURE TUBE
V13 23GP4
TO PICTURE TUBE MOUNTING BRACKET
117VAC 145 WATTS
SW ON VOL CONTROL
TO PIN 1 OF AUDIO OUTPUT TUBE V6
250V SOURCE
140V SOURCE
AGC KEYING SYNC SEP NOISE LIMITER
V6 3BU8
SYNC PHASE INV
V7 A 6CG7
VERT MULT
V7 B 6CG7
VERT MULT VERT OUTPUT
V9 12DT5
Taken with pin 6 of Vert. Mult. Output tube V9 shorted to ground.
DO NOT MEASURE
VERT HOLD
HEIGHT
VERT LINEARITY
YEL WH
BLUE
BLUE YEL
BLK WH
RED
DEFLECTION YOKE
T2
HORIZ-33 Ω
VERT-7.20 EACH WINDING
HORIZ MULT
V10 6CG7
HORIZ MULT
V11 6CG7
HORIZ OUTPUT
V10 12DQ6A
HORIZ FREQ
DO NOT MEASURE
250V HV RECT
V12 U3
TO PICTURE TUBE HV ANODE
(14KV-17KV) 14.5KV
DAMPER
V11 12AX4GTA
620V BOOST 250V SOURCE
DO NOT MEASURE
TERMINAL VIEW T3
TERMINAL VIEW M3
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
V11 V10 V9 V4 V6 V8 V1 V2
99VAC 79VAC 67VAC 61VAC 58VAC 46VAC 40VAC 28VAC 23VAC
V101 V102 V13 V5 V3
2VAC 7VAC 18VAC 16VAC
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
ADDITIONAL SCHEMATICS PAGE
V1E TUNER TA-50 3
V1E TUNER TA-56 3
1 DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied

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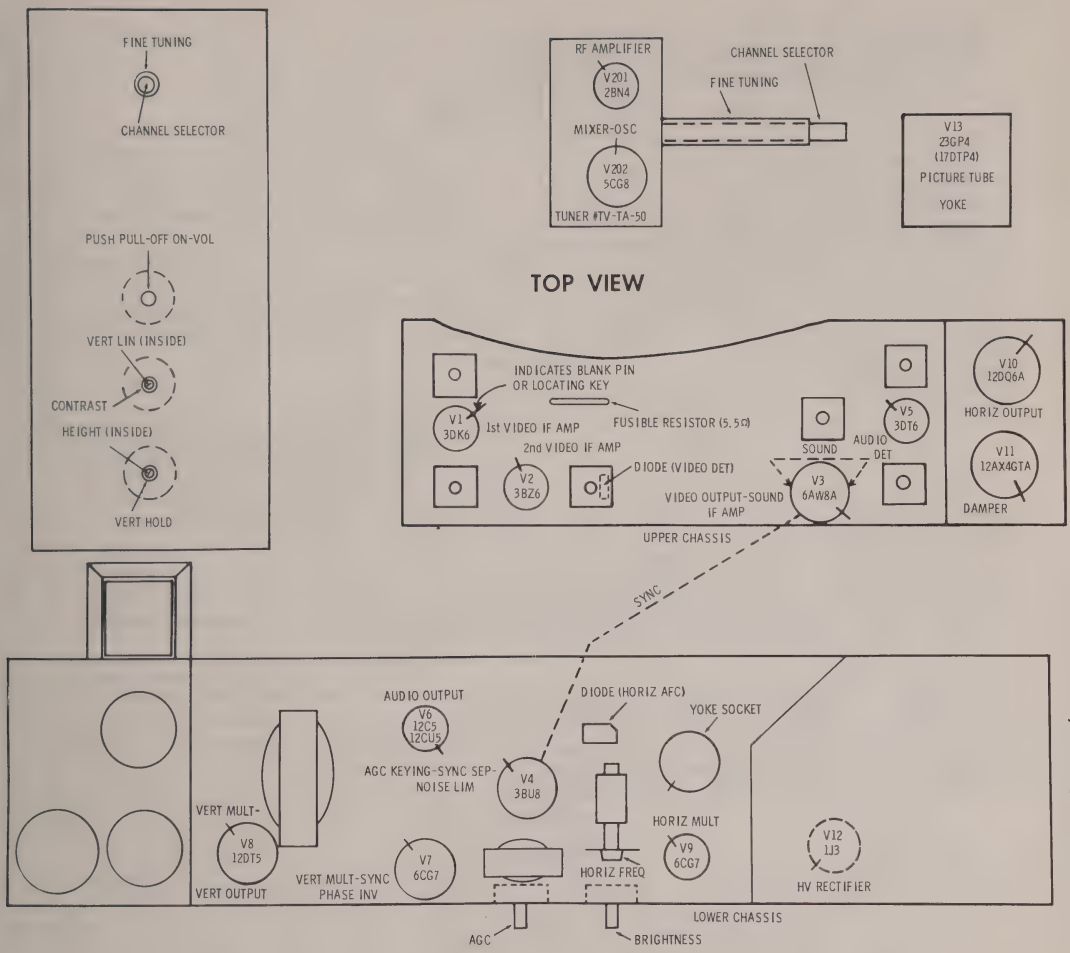
TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

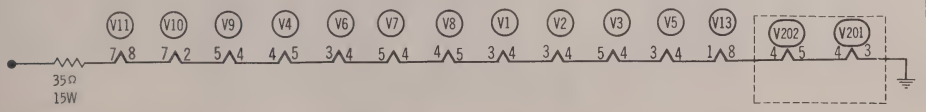
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (B+), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V13
No vertical deflection V7, V8
Poor vert. linearity or foldover V7, V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11. Rectifiers (B+)
Vert. off freq. V7, V8
Horiz. off freq. Diodes (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4, V7
No horiz. sync V4, V7
No vert. or horiz. sync V4, V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Al thru A9 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil . GENERAL CEMENT #9296, 9297
WALSCO # 2546, 2547

VIDEO IF ALIGNMENT

Set Contrast fully clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44MC (10MC Swp.)	41.25MC	Any non-interfering channel	Vert. Amp. thru 47K to point (A). Common to chassis. (Across Video Det. load.)	A1	Adjust to place marker in 41.25MC trap notch as in Fig. 1.
2.	"	"	42.75MC 45.75MC	"	"	Mixer Plate Coil & A2 thru A5	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil and A2 for maximum gain, A3 and A4 to shape high frequency side of response curve and A5 to shape low frequency side.

SOUND IF ALIGNMENT

Connect an output meter across the speaker voice coil.
Connect the DC probe of the VTVM to point (B). Common to chassis. Tune in a strong air signal and adjust A6 for maximum output.
If two peaks occur, use the one resulting in the highest reading on the VTVM.
Reduce the signal strength by disconnecting the antenna. Adjust A7 and A8 for maximum undistorted sound. Further reduce the signal strength by moving the antenna lead further away. Retouch A7 and A8 for maximum undistorted sound.
Repeat the entire procedure if necessary.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	High side thru .05mfd to point (A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	AC probe to point (C). Common to chassis. (Use 0-10 VAC scale.)	A9	Adjust for MINIMUM deflection.

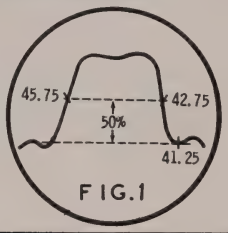
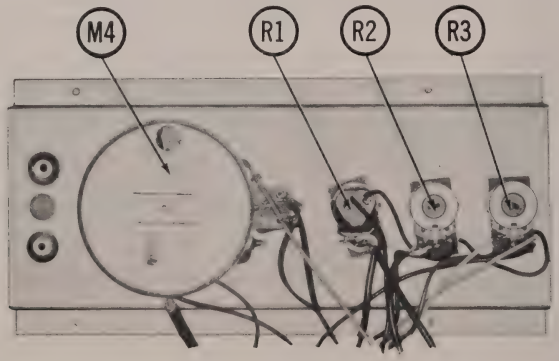
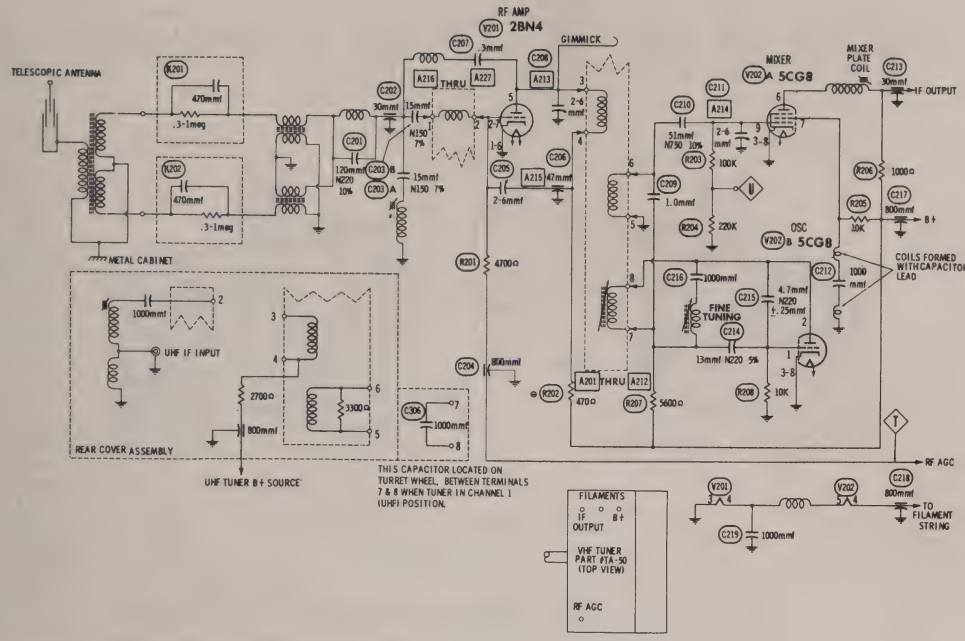


FIG.1



CONTROL PANEL



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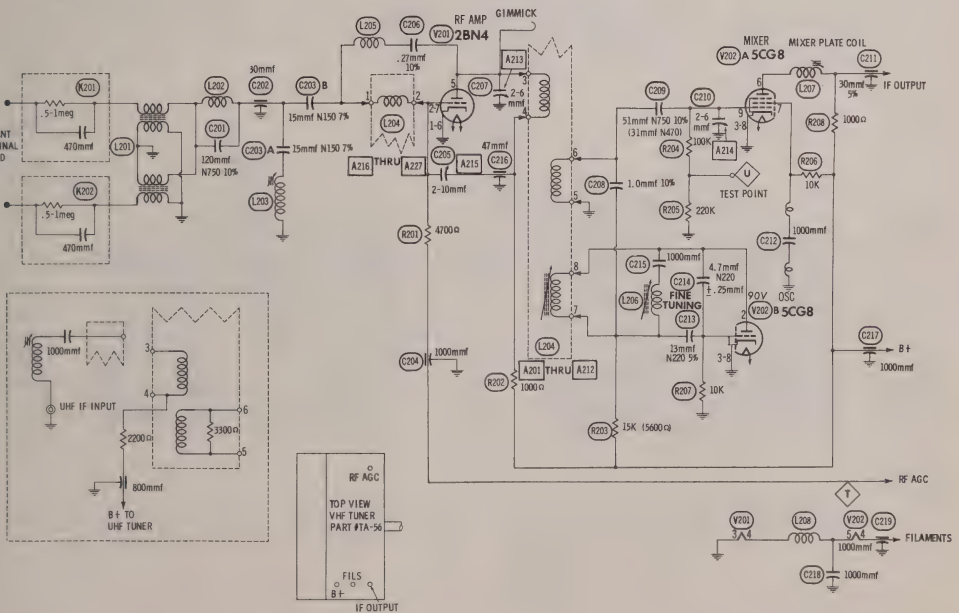
VHF TUNER TA-50



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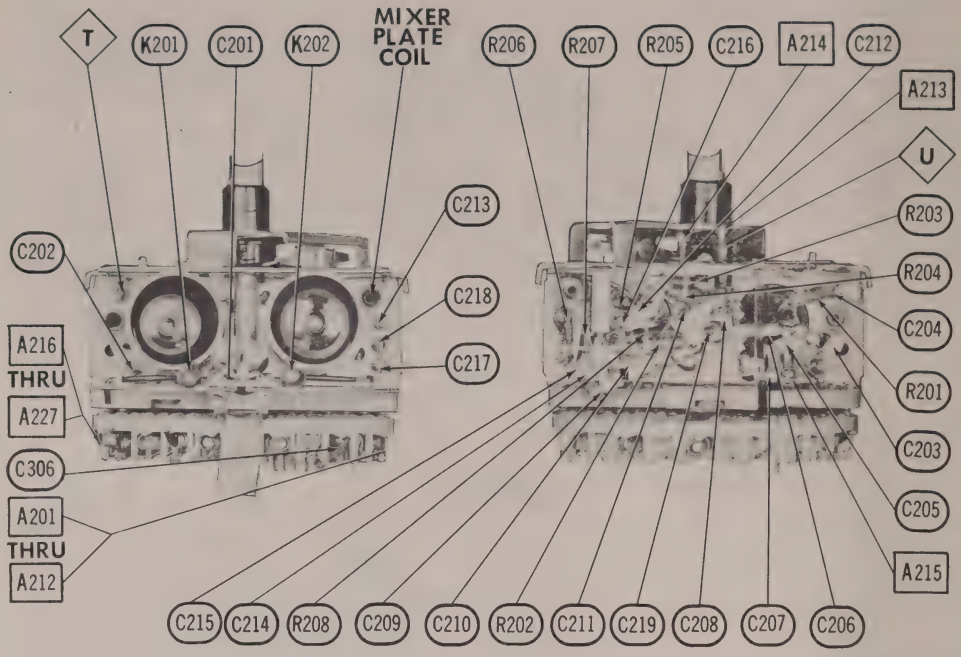
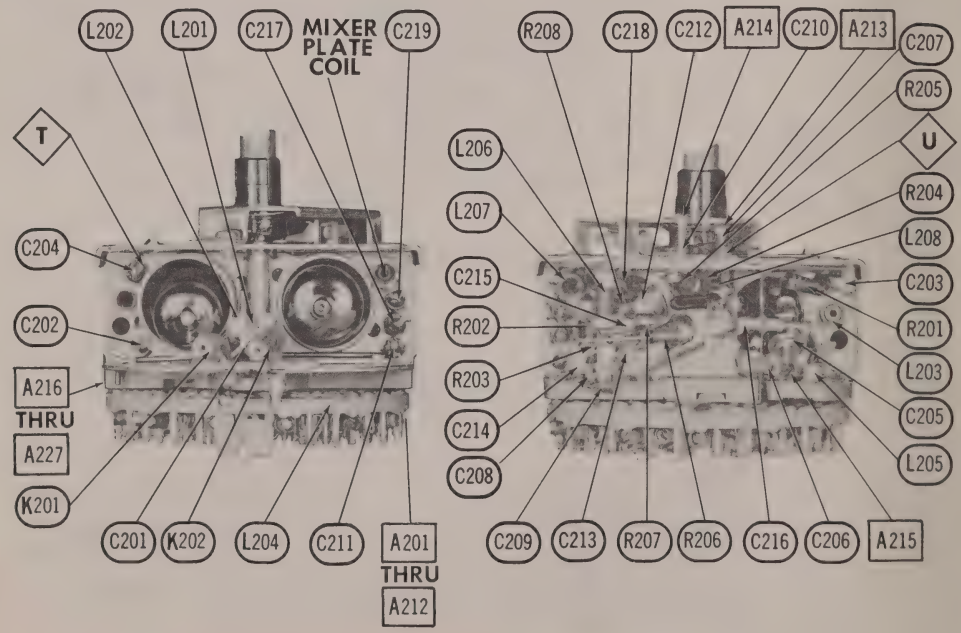
VHF TUNER TA-56



VHF TUNER TA-50



VHF TUNER TA-56

TUNER PARTS LIST AND DESCRIPTIONS

TA–56

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •
V201	RF Amplifier	2BN4	V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120	N750	10%			TCZ-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C202	30			#13M350U300N-02						
C203A	15	N150	7%	#13L8PG150N2				**		10TCP-Q15
B	15	N150	7%					**		10TCP-Q15
C204	1000				EF-001	MFT-1000		CCF-102	CT280A	
C205	2-10			#31B-902-09		829-10				
C206	.27		10%	#13D-111-45						
C207	2-6					829-6		VC-3	CT552	
C208	1.0		10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C209	51	N750	10%	(31MMF-N470)*		TCN-51		CCTN-470		
C210	2-6					829-6		VC-3	CT522	
C211	30		5%	#13M350U300J-01						
C212	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C213	13	N220	5%	#13L8R130J				**		10TCR-Q12
C214	4.7	N220	±.25mmf	#13L8R4R7C				**		10TCR-V47
C215	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	47			#13M130U470J-01		MFT-50				
C217	1000				EF-001	MFT-1000		CCF-102	CT280A	
C218	1000				BPD-001	DD-001	BYA10D1	CCD-102	B-210	5HK-D10
C219	1000				EF-001	MFT-1000		CCF-102	CT280A	

\# "Standard Coil" Part Number.
* Alternate Value.
** Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS	ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.				IRC PART No.	WORKMAN TV PART No.	
R201	4700Ω				R205	220K			
R202	1000Ω				R206	10K			
R203	15K			(5600Ω) *	R207	10K			
R204	100K				R208	1000Ω			

* Alternate Value

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES	ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3397		L205	RF Choke	34A-1005	
L202	RF Choke	34A-748		L206	Fine Tuning Coil	34A-787-03	
L203	IF Trap Coil	34A-762		L207	Mixer Plate Coil	31UA-580-017	
L204	Ant., RF, Mixer Grid & Osc. Coils	31T-3454-034-000	Channel 2-13 Includes Rotor & Coil Ass'y.	L208	Fil. Choke	31K-137-027	

Note : Part numbers listed above are "Standard Coil" Part Numbers.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K201	Antenna Filter	470mmf, .5-1meg	13P-195	Centralab RC-471 Sprague AC1-1
K202	Antenna Filter	470mmf, .5-1meg	13P-195	Centralab RC-471 Sprague AC1-1

Note : Part numbers listed above are "Standard Coil" Numbers.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	GENERAL ELECTRIC • TYPE	RAYTHEON • USE	RAYTHEON • TYPE	SYLVANIA • USE	SYLVANIA • TYPE
V1	1st Video IF Amp	3DK8	V7	Vert. Mult. - Sync Phase Inv.	V10	6CG7
V2	2nd Video IF Amp.	3BZ6	V8	Vert. Mult. - Vert. Output	V11	12DT5
V4	AGC Keying-Sync Sep. - Noise Limiter	6AW8A	V9	Horiz. Mult.	V12	6CG7
V5	Audio Det.	3DT6	V10	Horiz. Output	V13	12DQ6A
V6	Audio Output	19CB/13CU8	V11	Damper	V14	12AX4GTA
			V12	HV Rectifier	V15	1J3

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRAV-LER Part No.	GENERAL ELECTRIC Part No.	RCA Part No.	RAYTHEON Part No.	SYLVANIA Part No.	NOTES
V13	23GP4, 17DTP4		17DTP4 ①		23CP4 ③, 17DTP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SPRAGUE Part No.	NOTES
C1	140	200	EC-64 ①	AFH3H-3T-35	XA0366	FP131	TM8-1480	TVL-1540	
C2	140	300	EC-119	AFH3H-3T-35	XA0366	FP131	TM8-1570	TVL-1584	
C3A	100	300	EC-130 ③	AFH3H4-100-3E	D0044	FP330, 30	TMQ-4681	TVL-4711	
B	60	300			BR0305				
C	100	50							
C4	40	300	EC-113	PRH580	BR4038	TC58	TD-40-350	TVA-1511	

① Chassis 1150-89 uses Pt. #EC-54A in this application. ③ Chassis 1150-89 uses Pt. #EC-56A in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ELMENCO Part No.	MALLORY Part No.	SPRAGUE Part No.
C5	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10
C6	Mfd	100V		P2S30-1.0		CUB3W1	1DP-5-105	GEM-21	2TM-M1
C7	75	N750 5%			TCN-75	C10Q75U		CNT-475	10TCU-Q75
C8	1000	10%		DI-1000	DD-102	5S5JN	CCD-102	GP210	10TS-D10
C9	330		Note 1	DI-330	DD-331	BYA10T32	CCD-331	B-332	10TS-T33
C10	330			DI-330	DD-331	BYA10T32	CCD-331	B-332	10TS-T33
C11	Mfd	100V		P2S8N-1.0		CUB3W1	1DP-5-105	GEM-21	2TM-M1
C12	330			DI-330	DD-331	BYA10T32	CCD-331	B-332	10TS-T33
C13	560	5%				CUB3W1	1DP-5-105	GEM-21	2TM-M1
C14	1000	10%		DI-1000	DD-102	PM6DI	CCD-102	GP210	10TS-D10
C15	1000			BPD-005	DD-202	BYA20S	CCD-202	B-250	5HK-D50
C16	22	400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	2TM-P22
C17	.022	400V		P488N-022	DD-303	CUB4S22	4DP-5-223	GEM-4122	4TM-S22
C18	.047	1000V		P10S8N-047		CUB5S47	16DP-5-473	GEM-5147	4TM-S47
C19	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C20	1000	2000V		HVD-30-1000	DD-102	BYH20DA	3CCD-102	2HV-320	20GA-D8
C21	47	N750 10%		N750-1Z 47	DTN-47	C10Q47U	CCTN-470	CNT-447	10TCU-Q47
C22	4.7	10%		NPO-1E 4.7	TCZ-4R7	C10V47C	CCTQ-4R7	CNO-547	10TCC-V47
C23	1000	10%		DI-1000	DD-103	5S5JN	CCD-103	GP210	10TS-D10
C24	100	NPO 5%			DTZ-100	C1P71C		CNO-310	10TCC-T10
C25	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-347	5HK-D47
C26	1000	10%		DI-1000	DD-102	PM6DI	CCD-102	GP210	10TS-D10
C27	.047	200V		P283N-047	DD-503	CUB3S47	3DP-3-473	GEM-4147	2TM-S47
C28	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	10000	1400V		DAC-27	DDE-103	BYE10S	16DP-3-103	UAC-110	BL-S10
C31	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10
C32	10000			BPD-01	DD-103	BYA10S	CCD-103	B-110	5HK-S10
C33	150			DI-150	DD-151	L10T15	CCD-151	B-350	10TS-T15
C34	4700			BPD-0047	DD-472	BYA20D47M	CCD-472	B-347	5HK-D47
C35	1000	10%		DI-1000	DD-102	5S5JN	CCD-102	GP210	10TS-D10
C36	470	10%		DI-471	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C37	1000	10%		DI-1000	DD-102	5S5JN	CCD-102	GP210	10TS-D10
C38	2200			BPD-0022	DD-222	BYA10D22	CCD-222	B-322	5HK-D22
C39	1000	2000V		HVD-30-1000	DDH-102	BYH20DA	3CCD-102	2HV-320	20GA-D10
C40	.047	600V 10%		V84C6S47-10%		CUB6S47	6DP-3-473	GEM-1615	6TM-S47
C41	.1	600V 10%		V84C5P1-10%		CUB5P1	6DP-4-104	GEM-1001	6TM-P10
C42	.1	600V 10%		V84C5P1-10%		PM6DI	6DP-4-104	GEM-1001	6TM-P10
C43	.047	800V		P6S8N-047	DD-503	CUB6S47	6DP-3-473	GEM-1647	6TM-S47
C44	.047	600V		P6S8N-047	DD-503	CUB6S47	6DP-3-473	GEM-1647	6TM-S47
C45	.01	1600V		P16S4CM-01	DDE-103	CUB16S	16DP-3-103	GEM-1611	MB-S8
C46	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-347	5HK-D47
C47	.047	600V		P6S8N-047	DD-503	CUB6S47	6DP-3-473	GEM-1647	6TM-S47
C48	3900			1464-0039		1R5D39	CM-20B-392K	MCJ462.5	MS-392
C49	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ349	MS-368
C50	680	10%		1469-00068		5R5T68	CM-19B-681K	MCJ349	MS-368
C51	4700			BPD-0047	DD-472	BYA10D47M	CCD-472	B-347	5HK-D47
C52	.047	600V		P6S8N-047	DD-503	CUB6S47	6DP-3-473	GEM-1647	6TM-S47
C53	.027	1000V 10%		P1064CM-027		DPME0S3	16DP-5-303	GEM-1613	
C54	150	400V 10%	Pt. #CC-142						
C55	150	4000V 10%	Pt. #CC-142						
C56	120	2000V 5%							
C57	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-310	5HK-D10
C58	1000			BPD-001	DD-102	BYA10DI	CCD-102	B-310	5HK-D10
C59	1500			BPD-0015	DD-152	BYA20D15	CCD-152	B-215	5HK-D15
C60	5000			BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C61	.01	1600V		P1064CM-01	DDE-103	CUB16S	16DP-3-103	GEM-1611	MB-S8

Note 1. May not be used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	CTS-IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	500K	½	VC-120	BP1-80	CATS-500K-2	B13-133	PP55A	Volume
B	Shaft			Not Req.	K2S-3	Not Req.	Not Req.	
C	Switch			Not Req.	Not Req.	SKT	Not Req.	Push-Pull Off-On Contrast
R2A	100KΩ	½	VC-195A	P1-8		ⓦ-1518	GE6191	Vert. Linearity
B	150KΩ	½		R3-8				

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	CTS-IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R3A	200K	½	VC-194A	P1-33		ⓦ-1130	GE4131	Vert. Hold
B	2.5meg	½		R3-76		Bil-128	PT415L	Height
R4A	100K	½	VC-84	TT-40	B47-100K-S			AGC
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R5A	100K	½	VC-84	TT-40	B47-100K-S	Bil-128	PT415L	Brightness
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

† "CONCENTRIKIT" Equivalent: K-15 Kit with Base Elements and Shafts: Bil-104, P17-028 (Panel) Bil-129, R15-025 (Rear)

† "CONCENTRIKIT" Equivalent: K-15 Kit with Base Elements and Shafts: Bil-139, P17-028 (Panel) (Not available as a factory assembled unit). Bil-239, R15-005 (Rear)

* "TA-LOC" Equivalent: FA3SL, RU15SL, O3875A, IK3SS.

▲ "TA-LOC" Equivalent: FA2SL, RU25SL, O3875A, IM37.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC Part No.	WORKMAN TV Part No.	REMARKS
R6	10meg			
R7	2.5meg			
R8	2.5meg			
R9	180K			
R10	1000Ω			
R11	5200Ω 3W	PW5-5200	5W-SQ 5200	
R12	3900Ω 3W			
R13	47Ω			
R14	1800Ω			
R15	56Ω			
R16	390K			
R17	6800Ω			
R18	100Ω			
R19	47K			
R20	7500Ω 5W	PW5-7500	5W-SQ 7500	
R21	47K			
R22	39K			
R23	1200Ω			
R24	47Ω			
R25	180Ω			
R26	15K			
R27	82K			
R28	270K			
R29	4.7meg			
R30	56K			
R31	9300Ω 1W			
R32	39K			
R33	56K			
R34	100K			
R35	100K			
R36	330K			
R37	100K			
R38	8200Ω			
R39	560K			
R40	680Ω			
R41	1meg			
R42	1meg			
R43	150Ω			
R44	220Ω 2W			
R45	2.2meg			

① Not used in Chassis 1150-89.

ITEM No.	RATING	REPLACEMENT DATA: IRC Part No.	WORKMAN TV Part No.	REMARKS
R46	4.7meg			
R47	6800Ω			
R48	5800Ω			
R49	3300Ω			
R50	2200Ω			
R51	220K			
R52	820K			
R53	56K			
R54	2.2meg			
R55	330K			
R56	100Ω			
R57	390Ω 1W			
R58	39K 1W			
R59	39K			
R60	220Ω			
R61	220Ω			
R62	3.5Ω (Cold)			
R63	100K			
R64	100K			
R65	22K 3W	PW5-12000	5W-SQ 12K	
R66	4.7meg			
R67	470K			
R68	1500Ω			
R69	1500Ω			
R70	56K			
R71	9300Ω 1W			
R72	15K			
R73	470K			
R74	100Ω			
R75	12K 5W	PW5-12000	5W-SQ 12K	
R76	150K			
R77	470K			
R78	4700Ω			
R79	1.2Ω			
R80	5.5Ω	FR-5.5Ω	FS-5	
R81	100Ω		6Bl	6F-9 ①
R82	35Ω 15W			
R83	470K			
R84	330Ω			
R85	3300Ω			

▼ Tray-Ler Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRAV-LER ▼ Part No.	REPLACEMENT DATA
K1	Vert. Integrator	4700mmf, 10000mmf, 15K, 15K	CC-120	Centralab PC-392

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER Part No.	Merit Part No.	Miller Part No.	Stancor Part No.	NOTES
L1	1st Video IF	L-150	TV-127	6231	RTC-8558	
L1A	2nd Video IF	L-103				
B	41.25MC Trap					① Includes Complete Assembly.
L3	3rd Video IF	L-153 ①				
L4	RF Choke (10uh)	L-160	BC-566	4613	RTC-8522	
L5	RF Choke (27uh)	L-158	TV-192	4615	RTC-8525	
L6A	4.5MC Trap	L-167		1482IF7	RTC-8098	
B	1st Sound IF					
L7	Peaking	L-163 ③				② Wound on 4700Ω Resistor.
L8	Peaking	L-163 ③				③ Wound on 10K Resistor.
L9	2nd Sound IF	L-167				
L10	Quadrature	L-10A	TV-154	1481	RTC-8606	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER Part No.	Merit Part No.	Miller Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
L11	Horiz. Stabilizer (Horiz. Freq.)	L-156	TV-163	6210	RC110	RTC-8632	HS-5	WLC-35

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA: TRAV-LER Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
L12A	.250A	50Ω	.85 Hy.	FC-5A ①		C-2343		C-24X	

① Alternate Pt. #FC-5

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER Part No.	Merit Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T1	Vert. Output	TR-50B					26S14	A-140X
T2	Yoke (Horiz. 19MIC) 110° (Vert. 13.2MIC) Alternate Yoke	TVL-174 ⑤†		TPCM-2017 1 ② 3	DY-27A 1 ②		Y-52 1 ②	Y-80-1 ②
	Yoke (Horiz. 16.7MIC) 110° (Vert. 13.8MIC)	L-174 ④ † L-146B ⑤ ▲		TPCM-2017 1 ② 3	DY-27A 1 ②		Y-52 1 ②	Y-80-1 ②
	Yoke Clamp	ST-58						
T3	Horiz. Output	TR-51A	HVO-152 *	EFR-172 *	HO-304 *		FLY-137 *	D-151R *

① Use original rear cover and centering device.
② Use original yoke plug; connect same as original.
† Used in 23" Models.
③ Remove yoke damping network and use original damping network.
④ Includes rear cover and centering device.
▲ Used in 17" Models.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	5 & 4
6	6	4	6	6	6
7	7	2	7	7	7
8	8	1	8	8	8
2	2	7	2	1	2
1	1	8	1	2	1
Special Notes		⑤			

⑤ Remove one turn from Filament Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRAV-LER Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T4	2600Ω	3-4Ω	AT-52	A-3025	A-3333	24S53	S-12X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: TRAV-LER Part No.	QUAM Part No.	NOTES
SP1	5"	PM	3-4Ω	SPK-36 *	5A07	* Used in Models 23K8077, 23MT6055
	4"	PM	3-4Ω	SPK-42 *	4A07	▼ Used in Models 17P6005, 17P6015

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRAV-LER Part No.	RCA Part No.	SARKES TARZIAN Part No.	SYLVANIA Part No.	NOTES
M1	.250A	SR-14 *	1N1763 *	40H *	SR500 *	* Silicon Type
M2	.250A	SR-14 *	1N1763 *	40H *	SR500 *	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRAV-LER Part No.	GENERAL ELECTRIC Part No.	RAYTHEON Part No.	SYLVANIA Part No.	NOTES
M3		SR-15 *	6GD1 *			* Dual Selenium (Series Connected)

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER Part No.	NOTES
M4	Tuner	TA-50	VHF, Ch. 1150-89, 89
		TA-56	VHF, Ch. 1156-89
	Antenna	L-148	Telescopic, Models 17P6008 and 17P6015 JFD REPLACEMENT #TA-377

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	MP-139	Model 17P6015
Mask	MP-103	With Glass, Model 17P6006
Mask	MP-177	Models 23MT6055B, 23MT6055M
Mask	MP-178	Models 23K8077B, 23K8077M
Knob	K-351	VHF Channel Selector, Model 17P6005
Knob	K-349	VHF Channel Selector, Model 17P6015
Knob	K-422	VHF Channel Selector, Model 23MT6066B
Knob	K-335A	VHF Channel Selector, Model 23MT6055M
Knob	K-412	VHF Channel Selector, Models 23K8077B, 23K8077M
Knob	K-411	Fine Tuning, Model 23K8077
Knob	K-201	Fine Tuning, Models 23MT6055B, 23MT6055M, 17P6008
Knob	K-350	Fine Tuning, Model 17P6015
Knob	K-353	Volume, Model 17P6008

TRAV-LER CHASSIS 1150-80, 1150-89, 1156-89

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Knob	K-355	Volume, Model 17P6015
Knob	K-409	Volume, Models 23K6077M, 23K6077B
Knob	K-420	Volume, Model 23MT6055B
Knob	K-353M	Volume, Model 23MT6055M
Knob	K-352M	Contrast, Vertical Hold, Model 23MT6055M
Knob	K-421	Contrast, Vertical Hold, Model 23MT6055B
Knob	K-410	Contrast, Vertical Hold, Models 23K6077B, 23K6077M
Knob	K-352	Contrast, Vertical Hold, Model 17P6008
Knob	K-354	Contrast, Vertical Hold, Model 17P6015
Cabinet	C-380-1	Metal, Models 23MT6055B, 23MT6055M
Cabinet	CA-389	Plywood, Models 23K6077B, 23K6077M
Handle	CH-116	White, Model 17P6015
Handle	MS-629	Model 17P6008

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

TA-50

TUBES

GENERAL ELECTRIC			RAYTHEON			SYLVANIA	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V201	RF Amplifier	2BN4	V202	Mixer - Osc.	5CG8		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N220 10%	#13L-031				*		10TCR-T12
C202	30	#13M350U300N-02						
C203A	15 N150 7%	#13L8PGI50N2				*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C204	800		EF-001	MFT-1000		CCF-102		
C205	2-6			829-6		VC-3	CT552	
C206	47		EF-000050	MFT-50				
C207	.3							
C208	2-6			829-6		VC-3	CT552	
C209	1		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C210	51 N750 10%		N750-DI 47	TCN-51	C10Q51U	CCTN-470	CN7-447	10TCU-Q47
C211	2-6			829-6		VC-3	CT552	
C212	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C213	30	#13M350U300N-02						
C214	13 N220 5%	#13L8R130J				*		
C215	4.7 N220 ±25mmf	#13L8R4R7C				*		
C216	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C217	800		EF-001	MFT-100		CCF-102	CT280A	
C218	800		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# STANDARD COIL Part Numbers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	4700Ω				R205	10K			
R202	470Ω ①				R206	1000Ω			
R203	100K				R207	5600Ω			
R204	220K				R208	10K			

① Some versions may use 1000Ω in this application.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .3-1meg		Centralab RC-471 Sprague AC1-1
K202	Antenna Isolation	470mmf, .3-1meg		Centralab RC-471 Sprague AC1-1

TUNER ALIGNMENT INSTRUCTIONS

TA-50, TA-56

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A213 thru A215 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A202	
		201MC	199.25MC 203.75MC	11		A203	
		195MC	193.25MC 197.75MC	10		A204	
		189MC	187.25MC 191.75MC	9		A205	
		183MC	181.25MC 185.75MC	8		A206	
		177MC	175.25MC 179.75MC	7		A207	
		85MC	83.25MC 87.75MC	6		A208	
		79MC	77.25MC 81.75MC	5		A209	
		69MC	67.25MC 71.75MC	4		A210	
		63MC	61.25MC 65.75MC	3		A211	
		57MC	55.25MC 59.75MC	2		A212	

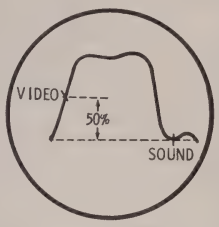


FIG.201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A213 A214 A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope.
3.	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

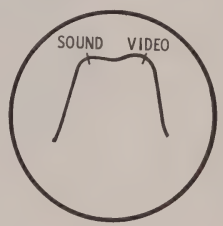
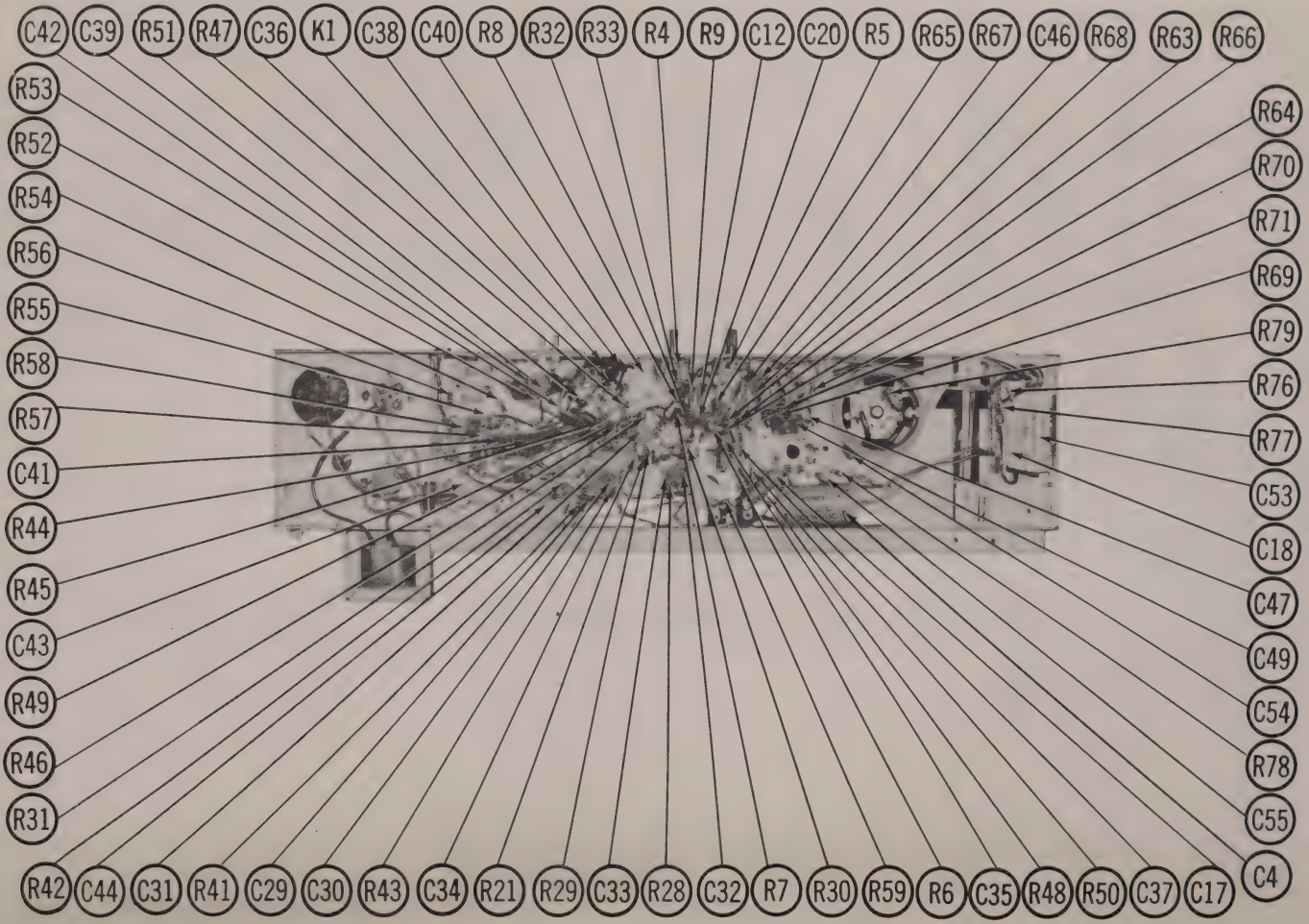
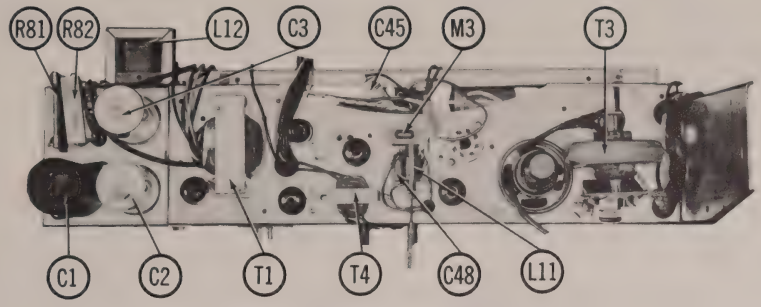


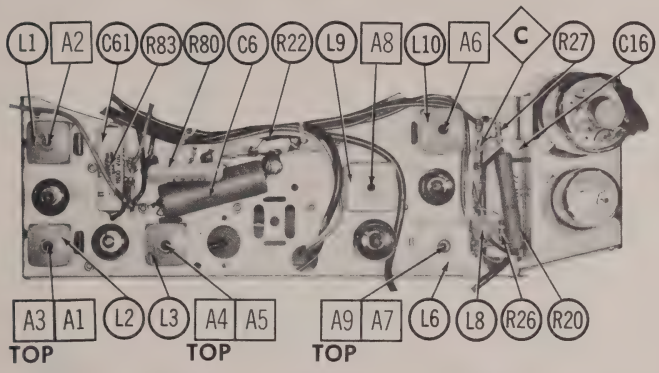
FIG.202



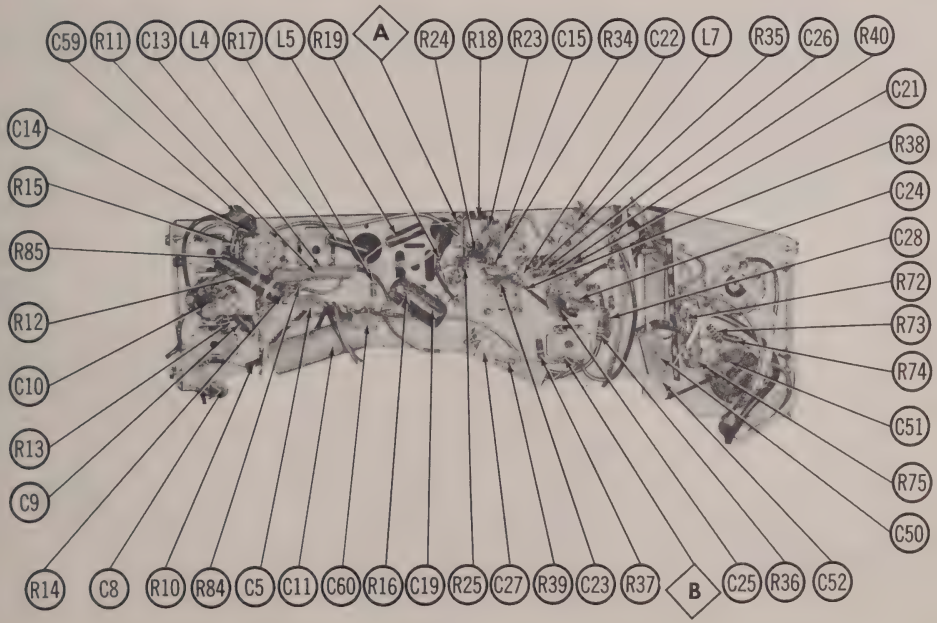
LOWER CHASSIS - BOTTOM VIEW



LOWER CHASSIS - TOP VIEW

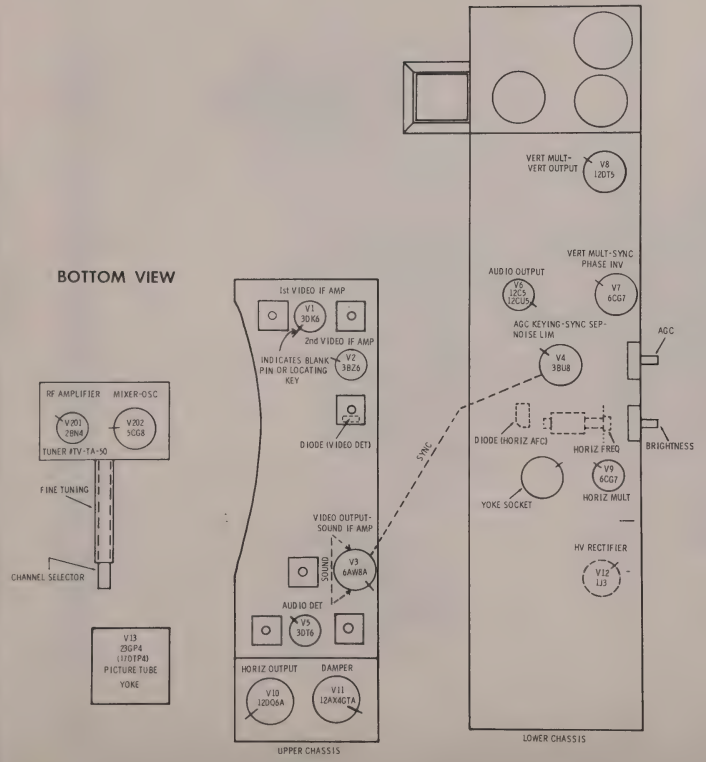


UPPER CHASSIS - TOP VIEW



UPPER CHASSIS - BOTTOM VIEW

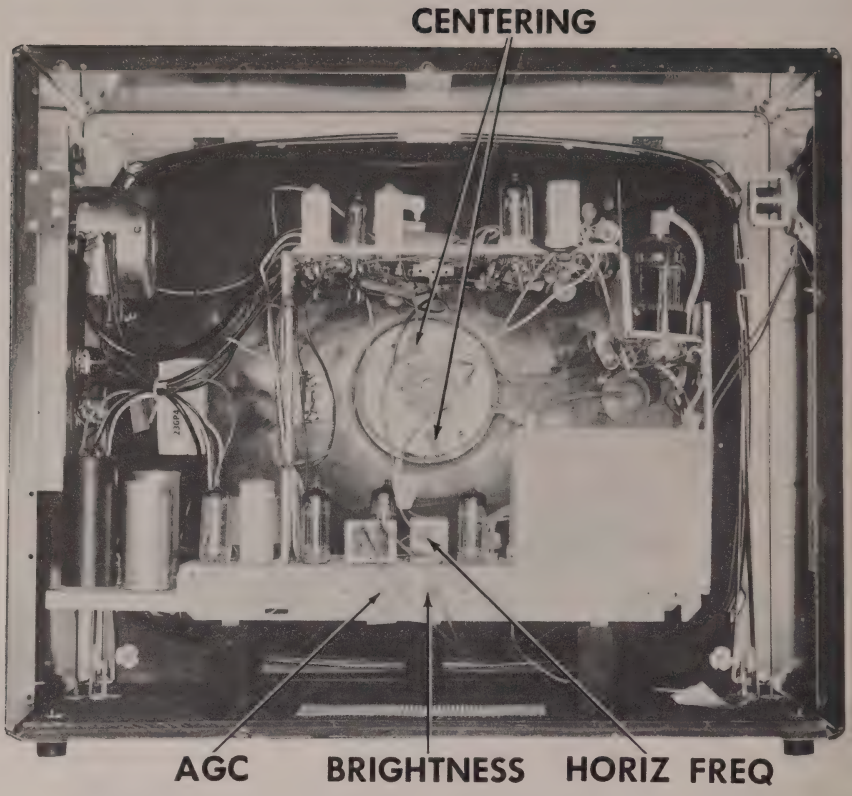
TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	150K	47Ω	10Ω	9Ω	▪ 3900Ω	▪ 3900Ω	0Ω		
V2	3BZ6	0Ω	56Ω	9Ω	8Ω	▪ 1800Ω	▪ 1800Ω	0Ω		
V3	6AW8A	0Ω	100K	▪ 100K	6Ω	8Ω	• 65Ω	6900Ω	▪ 1200Ω	† 7500Ω
V4	3BU8	▪ 0Ω	† 8200Ω	2.3meg	21Ω	20Ω	25K	† 390K	† 47K	▪ 4.7meg
V5	3DT6	18Ω	680Ω	6Ω	5Ω	† 330K	▪ 8200Ω	560K		
V6	12C5 12CU5	¶	600K	20Ω	16Ω	NC	† 270Ω	† 475Ω		
V7	6CG7	• † 1.3meg	220K	• 100K	1.4Ω	16Ω	† 13K	2.2meg	3300Ω	0Ω
V8	12DT5	† 150Ω	NC	NC	14Ω	10Ω	2.2meg	• 650Ω	NC	† 425Ω
V9	6CG7	† 7500Ω	5meg	1500Ω	21Ω	23Ω	† 100K	56K	1500Ω	0Ω
V10	12DQ6A	NC	23Ω	NC	† 12K	470K	TP	27Ω	0Ω	TOP CAP † 8Ω
V11	12AX4GTA	NC	NC	¶	NC	† 50Ω	NC	31Ω	27Ω	
V12	1J3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 470Ω
V13	23GP4	5Ω	39K	† 150K	† 50Ω	NC	NC	• 100K	3Ω	
V201	2BN4	0Ω	4.8meg	0Ω	1Ω	▪ 1300Ω	0Ω	4.8meg		
V202	5CG8	10K	▪ 6000Ω	0Ω	3Ω	1Ω	▪ 1300Ω	▪ 11K	0Ω	300K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1. ▪ MEASURED FROM PIN 1 OF V6.
‡ MEASURED FROM PIN 3 OF V11. NC NO CONNECTION TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast Controls for a normal picture.

Turn the Horizontal Frequency clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Frequency slowly counterclockwise until the picture just falls into sync.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 23MT6055M

1. Remove 5 push-on type knobs at side of cabinet.
2. Remove 11 screws holding rear cover.
3. Remove rear cover.
4. Remove antenna lead.
5. Remove 4 screws holding control panel.
6. Remove control panel.
7. Remove picture tube socket, yoke plug, and high voltage lead.
8. Remove 2 chassis bolts (thru 2 wooden mounting blocks).
9. Remove speaker leads.
10. Remove chassis.

PICTURE TUBE AND CHASSIS REMOVAL

The chassis and picture tube may be removed as a unit by removing the mounting board as follows:

1. Follow step 1 through 6 of "Chassis Removal".
2. Remove speaker leads.
3. Remove 1 screw at top (inside) holding the picture tube mounting to cabinet.
4. Remove 6 chassis bolts from bottom of cabinet and pull mounting board (with chassis and picture tube) out back.

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 252**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 475

FISHER MODEL SA-300B

Fisher Model SA-300 was covered in PHOTOFACT Folder 3 - Set 475.

Model SA-300B which is electrically similar except for the following changes is added with the publication of this bulletin.

COMPONENTS OMITTED

C12 and C13 are omitted; they are replaced with a jumper wire.

C33 and C34 are omitted; they are replaced with a jumper wire.

R11 is omitted.

R37 is omitted.

COMPONENTS ADDED

A Center Channel Output Jack is added.

A 1000Ω ½ watt resistor (Part #RC20BF102K) is added from the Center Channel to ground.

An 8200Ω ½ watt resistor (Part #RC20BF822K) is added from the Center Channel to the 16 ohm tap of T2 (Output Transformer).

An 8200Ω ½ watt resistor (Part #RC20BF822K) is added from the Center Channel to the 16 ohm tap of T3 (Output Transformer).

PRODUCTION CHANGE
BULLETIN 252

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 497

KNIGHT MODEL KN-740B

Knight Model KN-740 (92SU429) was covered in PHOTOFACT Folder 10 - Set 497.

Model KN-740B which is electrically similar except for the following changes is added with the publication of this bulletin.

COMPONENT CHANGES

R18 is increased from 22K to 68K.

C10 is decreased from 10000mmf to 6800mmf.

R24 is increased from 3300Ω to 4700Ω.

R32 is increased from 22K to 33K.

R46 is increased from 22K to 68K.

C25 is decreased from 10000mmf to 6800mmf.

R49 is increased from 3300Ω to 4700Ω.

R59 is increased from 22K to 33K.

COMPONENTS ADDED

A 2.2meg Resistor is added from the junction of R27, R28 to ground.

A 2.2meg Resistor is added from the junction of R55, R56 to ground.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

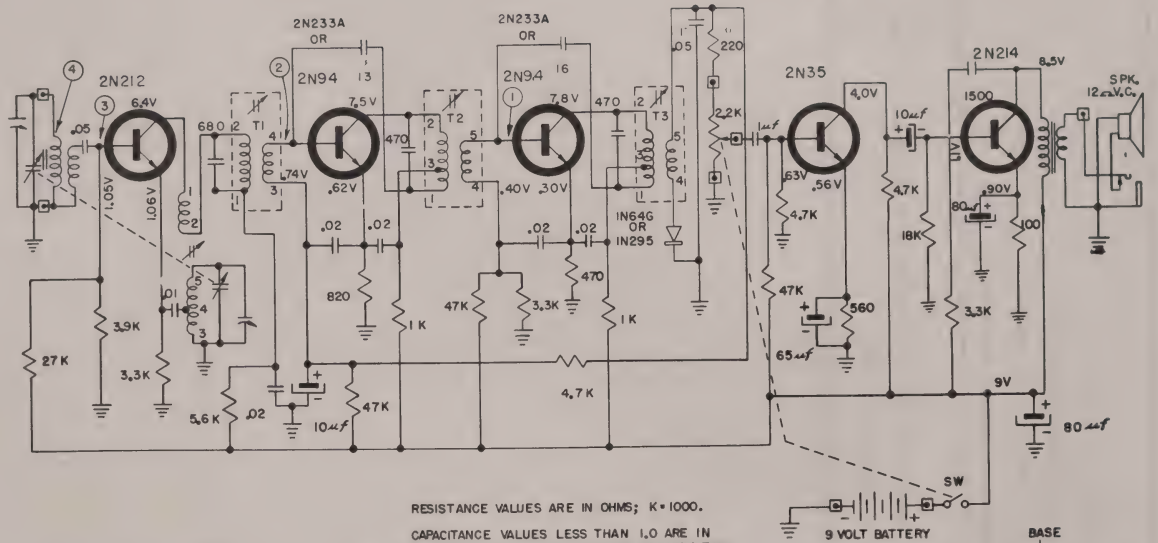
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 395		ARVIN MODEL 8576 (CH. 1.41401, 1.41402)
	Arvin Model 8576 (Ch. 1.41400) was covered in PHOTOFACT Folder 5 - Set 395. Model 8576 (Ch. 1.41401, 1.41402) which is electrically similar except for the following changes is added with the publication of this bulletin.	
Ch. 1.41401	COMPONENT CHANGES C10 is increased from 10mmf to 14mmf. C17 is decreased from 100000mmf to 500000mmf. L2 (Oscillator Coil) is changed to Part #44383-5. T1 (Output Transformer) is changed to Part #44858-2.	
Ch. 1.41402	COMPONENT CHANGES This chassis has several component changes as well as circuit changes. A schematic diagram showing the changes is given in this bulletin.	

(Continued On The Reverse Side)

MODEL 8576

CHASSIS 1.41402



SIGNAL TEST POINT	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR .005 WATT OUTPUT (.025V. ACROSS V.C.)
1	455KC	.05mf	1500 μV
2	455KC	.05mf	50 μV
3	455KC	.05mf	8 μV
4	1000KC	STANDARD LOOP	250 μV / M

RESISTANCE VALUES ARE IN OHMS; K = 1000.

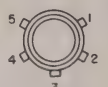
CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (mf), AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (mmf) EXCEPT WHERE NOTED.

VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION.

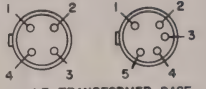
⏚ = COMMON GROUND SYMBOL.

⊡ = EXTERNAL CONNECTION TO PRINTED CIRCUIT.

TRANSISTOR



OSCILLATOR COIL



I.F. TRANSFORMER BASE (BOTTOM VIEWS)

Schematic Diagram Courtesy Of Arvin Industries, Inc.

PHOTOFACT® Folder with CIRCUITRACE®

AIRLINE MODELS GEN-1130A, GEN-1130B, GEN-1131A

AIRLINE MODELS GEN-1130A, GEN-1130B, GEN-1131A

MODEL GEN-1131A

AIRLINE MODELS GEN-1130A, GEN-1130B, GEN-1131A

TRADE NAME	Airline Models GEN-1130A, GEN-1130B, GEN-1131A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago 7, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 6MA@9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC 10MA@9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3... GENERAL CEMENT#5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A5.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1670KC	"	"	A4	"
3.	"	525KC	Tuning gang fully closed.	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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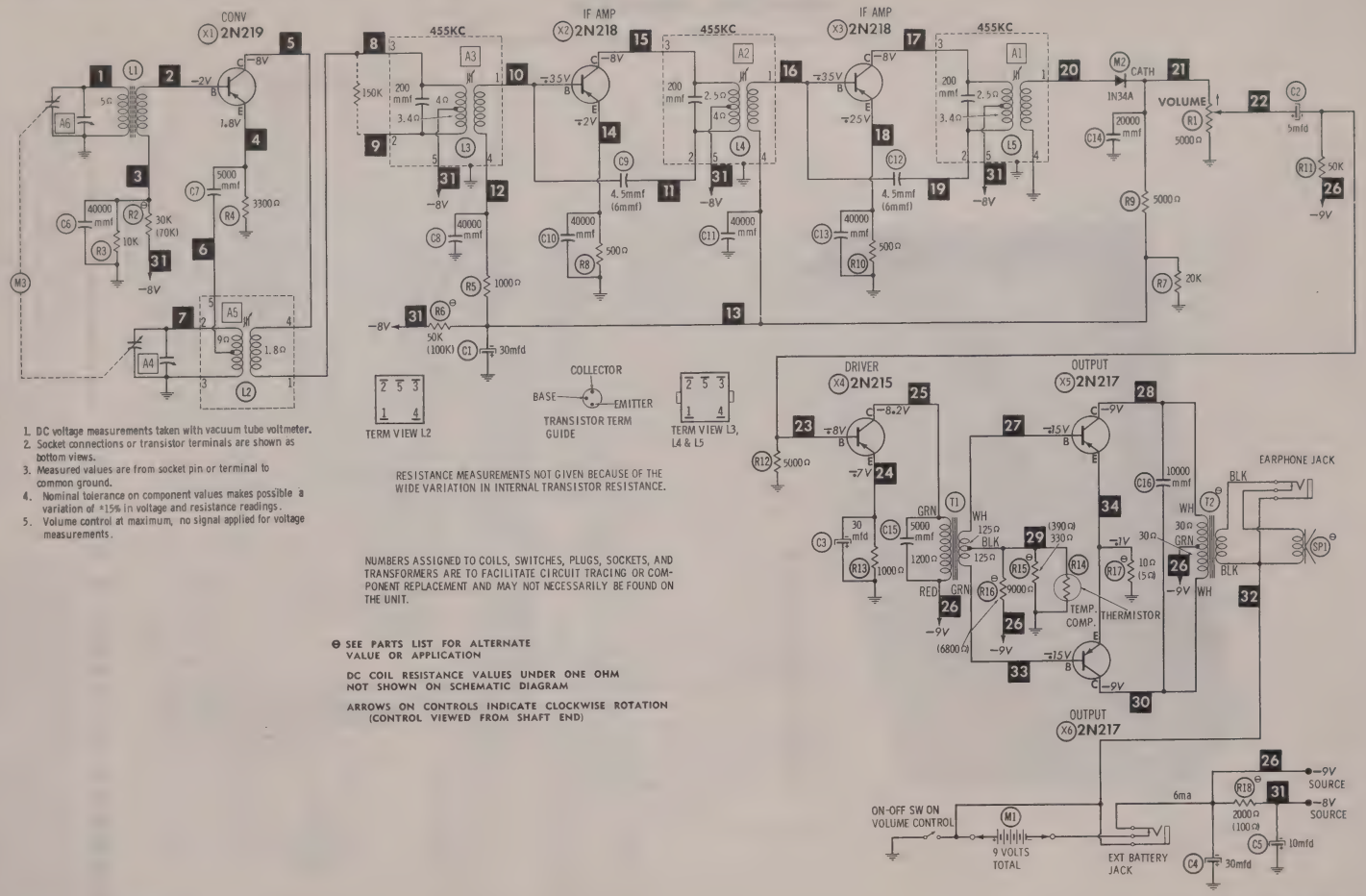
KF-301

SET 516 FOLDER 4



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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AIRLINE MODELS GEN-1130A, GEN-1130B, GEN-1131A

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N219	Converter	2N219	2N486	2N219	PNP
X2	2N218	1st IF Amp.	2N218	2N483	2N218	PNP
X3	2N218	2nd IF Amp.	2N218	2N483	2N218	PNP
X4	2N215	Driver	2N407	2N362	2N104	PNP
X5	2N217	Output	2N407	2N633	2N217	PNP
X6	2N217	Output	2N407	2N633	2N217	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6	J-971	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C2	5	6	J-973	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C3	30	6	J-971	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C4	30	10	J-972	XPP-10030	NLW30-15	TT15X30	MLV40-12	TE-1158	
C5	10	10	J-974	XPP-10010	NLW10-10	TT12X10	ML10-12	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	40000							
C7	5000		C80V502AM	DA-502	H-05D5	CCD-502	TA-250	TG-D50
C8	40000							
C9	4.5	(6) †	NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C10	40000							
C11	40000							
C12	4.5	(6) †	NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C13	40000							
C14	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C15	5000		C80V502AM	DA-502	H-05D5	CCD-502	TA-250	TG-D50
C16	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10

† Alternate Value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10	V-500S					Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	30K	(70K) *
R3	10K	
R4	3300Ω	
R5	1000Ω	
R6	50K	(100K) *
R7	20K	

ITEM No.	RATING	REMARKS
R8	500Ω	
R9	5000Ω	
R10	500Ω	
R11	50K	
R12	5000Ω	
R13	1000Ω	

ITEM No.	RATING	REMARKS
R14	Temp. Comp.	Pt. #B-2B
R15	330Ω	(390Ω) *
R16	9000Ω	(6800Ω) *
R17	10Ω	(5Ω) *
R18	2000Ω	(100Ω) *

* Used in Model GEN-1130A.

PRINTED BOARD

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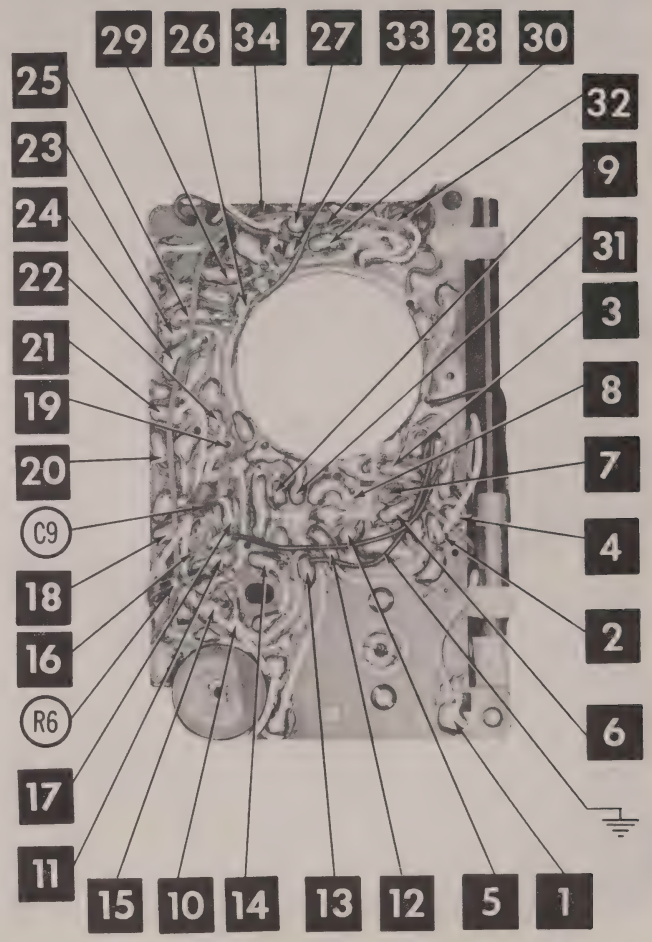


AIRLINE MODELS GEN-1130A, GEN-1130B, GEN-1131A

FOLDER 4

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick	LA-502				
L2	Osc. Coil	7030				
L3	1st IF Trans.	8511				
L4	2nd IF Trans.	8503				
L5	3rd IF Trans.	8518				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	T-453					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1100Ω CT	10-12Ω	OT-503①					① Alternate Part #OT-501

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	6P-2A *		* Some versions may use 2½" unit (Part #PM-224A).

BATTERIES

ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	124		2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		AIRLINE PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N34A		1N34A	1N34A	Detector (Pigtail)

MISCELLANEOUS

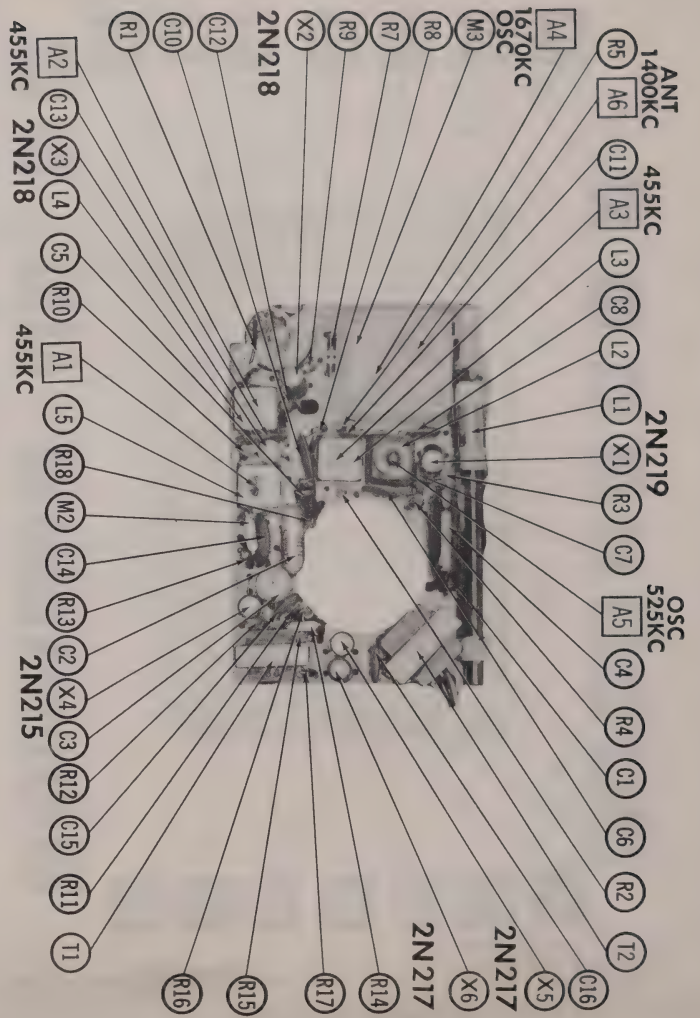
ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuning Cap. Earphone	C-129 62-3406	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	K-516EX	Tuning
Knob	K-506	Volume
Cabinet	1121-01A	"A"
Cabinet	1121-01B	"B", Rear Cover
Case	62-3405	Carrying, Model GEN-1130A, GEN-1130B

CHASSIS—TOP VIEW



PHOTOFACT® Folder

ANDREA MODEL CPR-A2S
(Ch. SRQ12T-1, A2S)

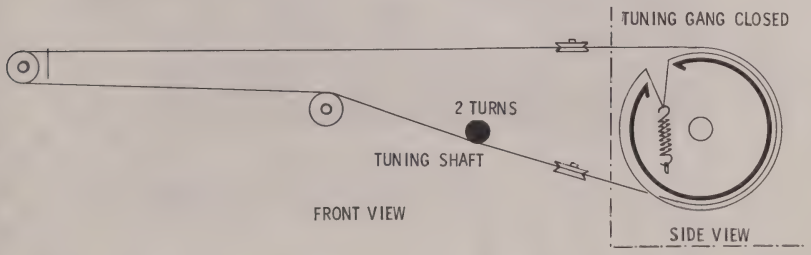
ANDREA MODEL CPR-A2S
(Ch. SRQ12T-1, A2S)

ANDREA MODEL CPR-A2S
(Ch. SRQ12T-1, A2S)

TRADE NAME	Andrea Model CPR-A2S (Tuner Ch. SRQ12T-1, Amp. Ch. A2S)		
MANUFACTURER	Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.		
TYPE SET	AC Operated 13 Tube FM-AM Tuner With Stereo Preamplifier, 7 tube Stereo Amplifier, and 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	170 Watts, 1.5 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 — 1600KC	FREQ. MOD.	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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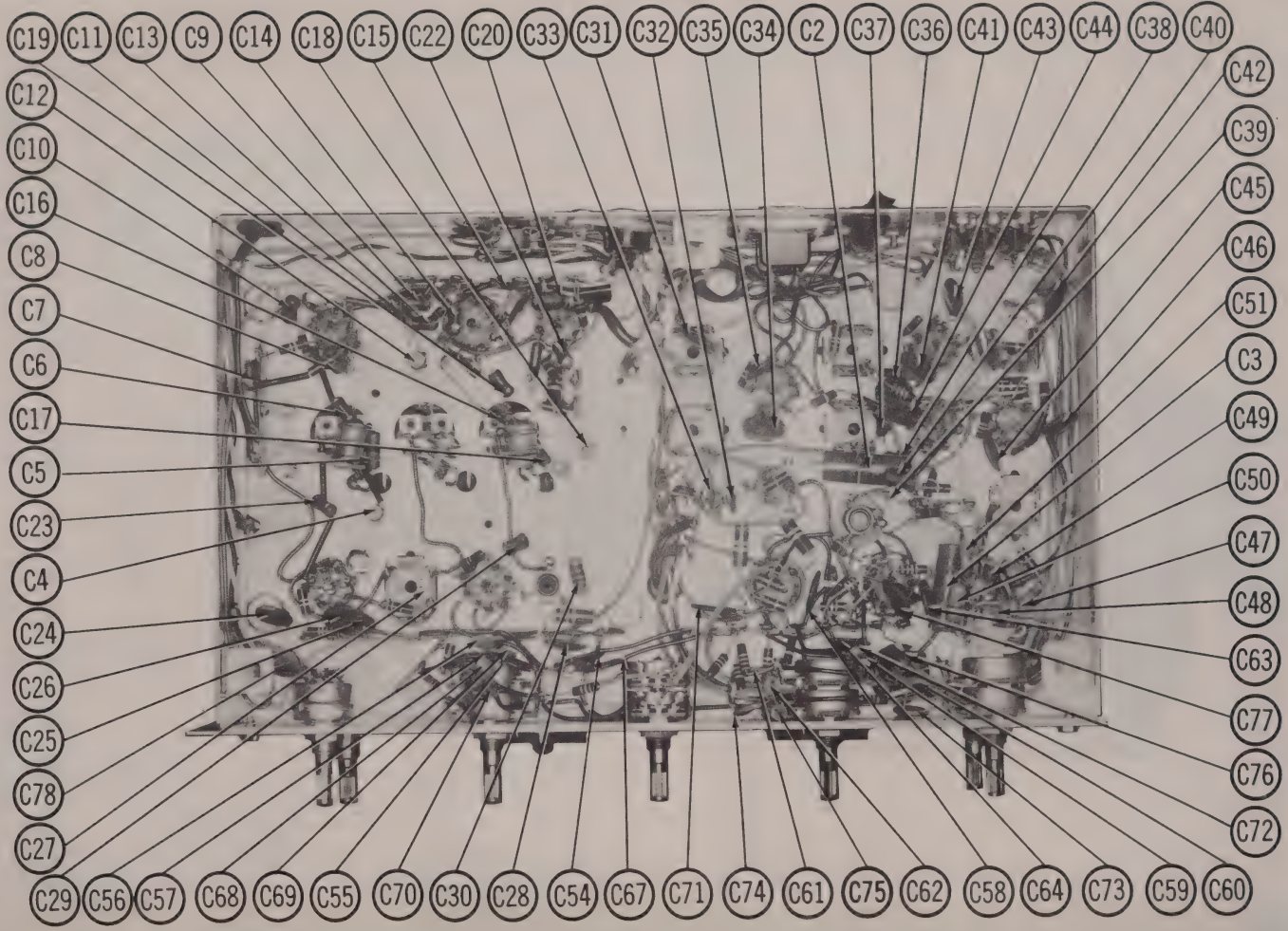
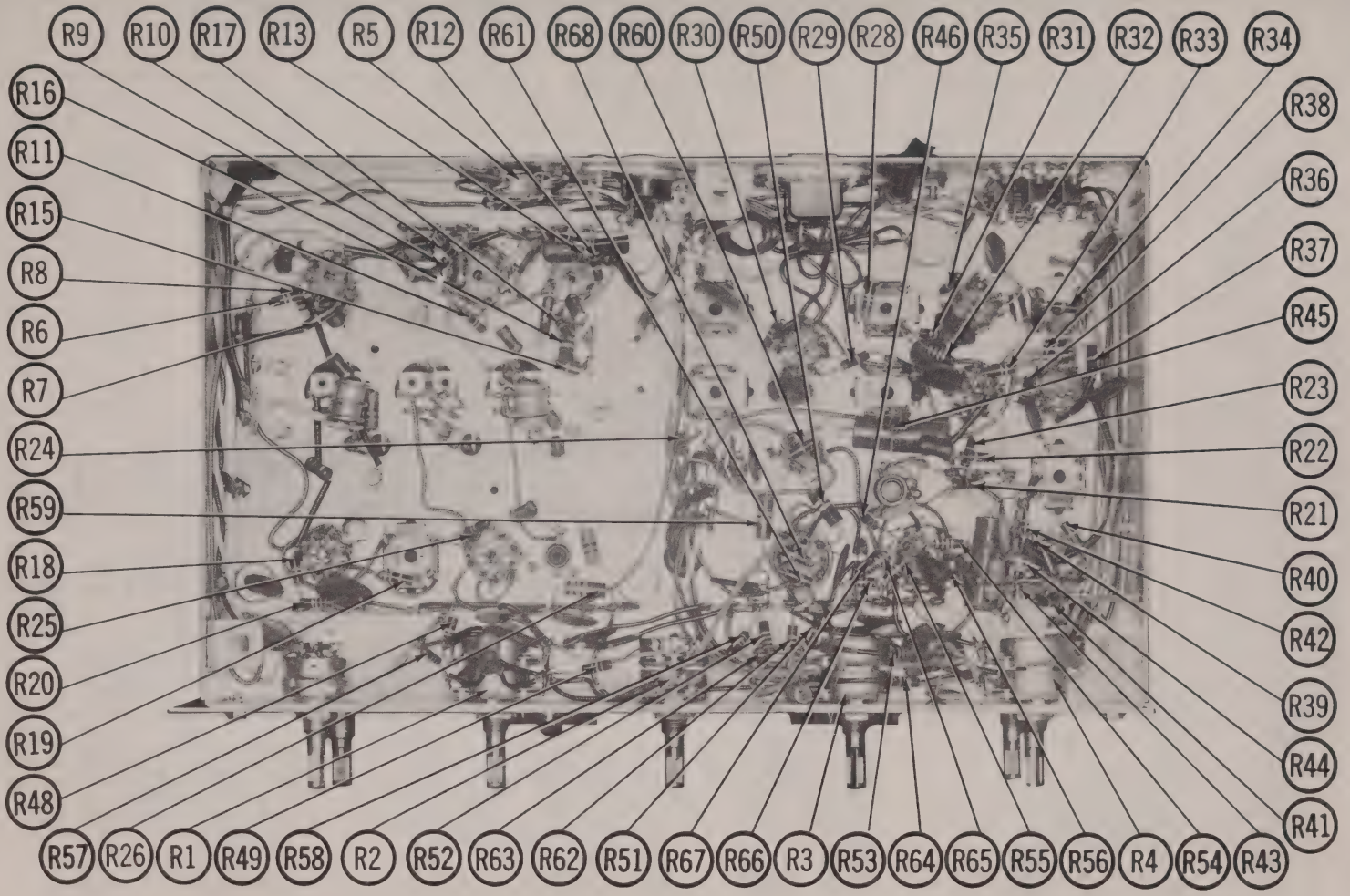


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
- A1 Thru A4, A8, A11 Thru A17.. GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
- A5, A6, A7, A18, A19, A20..... GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
- A10..... GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (Unmod.)	(AM) Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	High side to AM antenna terminal. Low side to chassis.	1700KC	1700KC	"	A5, A6, A7	"
3.	"	600KC	600KC	"	A8, A9	"
4.	"	1500KC	1500KC	"		Retouch A6 and A7 for maximum deflection. Repeat Steps 3 and 4.
5.	"	1500KC (10KC Mod.)	"	AC probe to Tuner output jack. Common to chassis.	A10	Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .01mfd to pin 1 (grid) of 2nd FM IF. Low side to chassis.	10.7MC (Unmod.) 18,000 uv.	(FM) Point of non-interference.	DC probe to point (B). Common to chassis.	A11, A12	Adjust for maximum deflection.
7.	"	"	"	DC probe to point (C). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	High side thru .01mfd to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	10.7MC (Unmod.) 6000 uv.	"	DC probe to point (B). Common to chassis.	A14, A15	Adjust for maximum deflection.
9.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.) 150 uv.	"	"	A16, A17	Adjust for maximum deflection. Repeat Steps 7 and 8.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side thru .01mfd to pin 1 (grid) of 2nd FM IF Amp. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (B). Low side to chassis.	A11, A12	Disconnect Stabilizing Capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
7.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.
8.	High side thru .01mfd to pin 1 (grid) of 1st FM IF Amp. Low side to chassis.	"	"	Vert. amp. to point (B). Low side to chassis.	A14, A15	Disconnect C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
9.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	"	"	"	A16, A17	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.

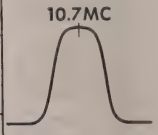


FIG. 1

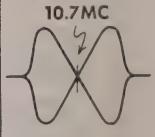
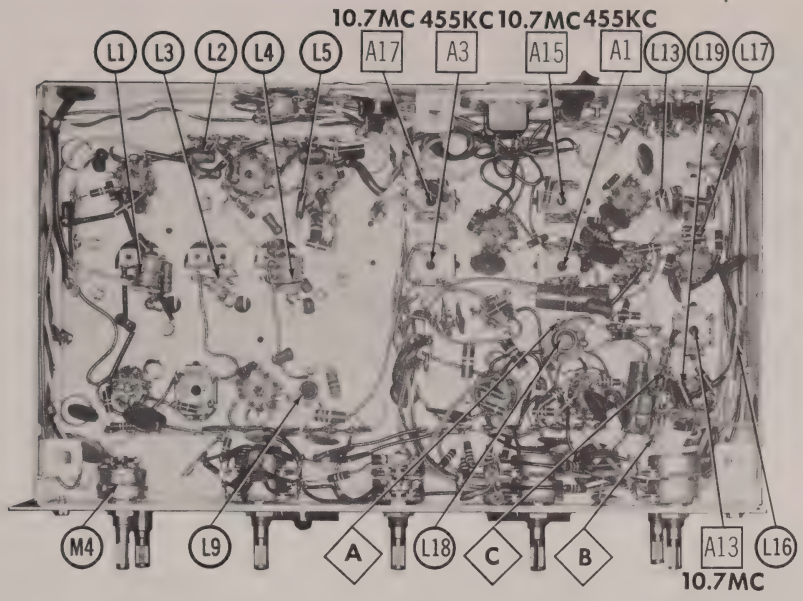


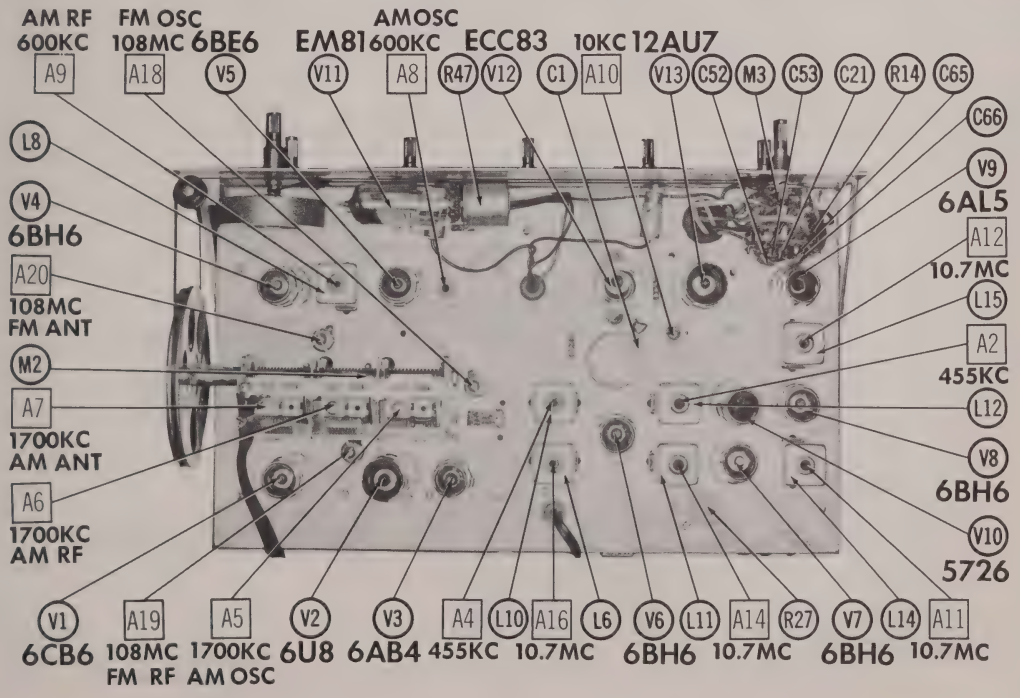
FIG. 2

FM RF ALIGNMENT—SELECTOR IN FM POSITION

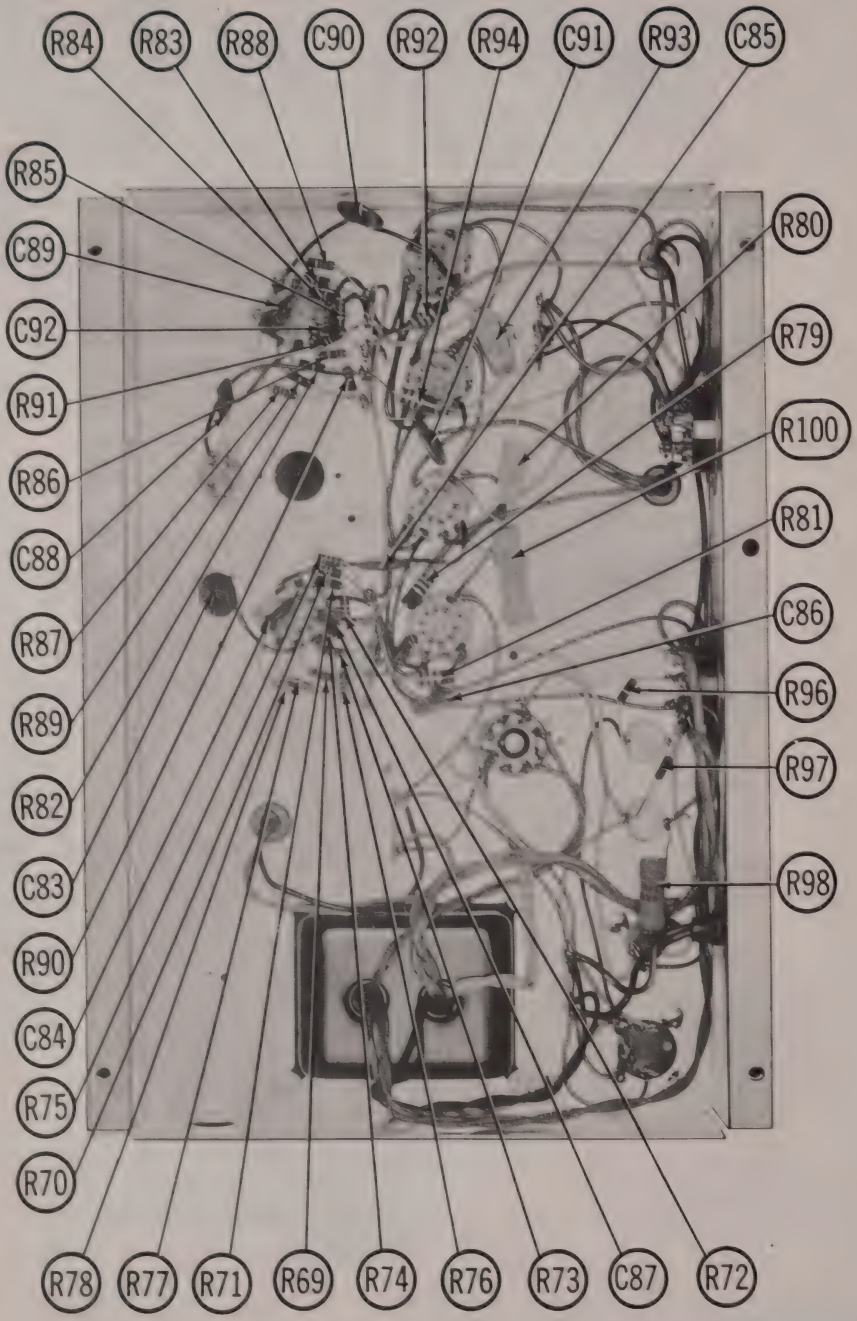
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
10.	Across FM antenna terminals with 270Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe to point (B). Common to chassis.	A18	Adjust for maximum deflection.
11.	"	"	(FM/AFC) 108MC	"	A19, A20	"



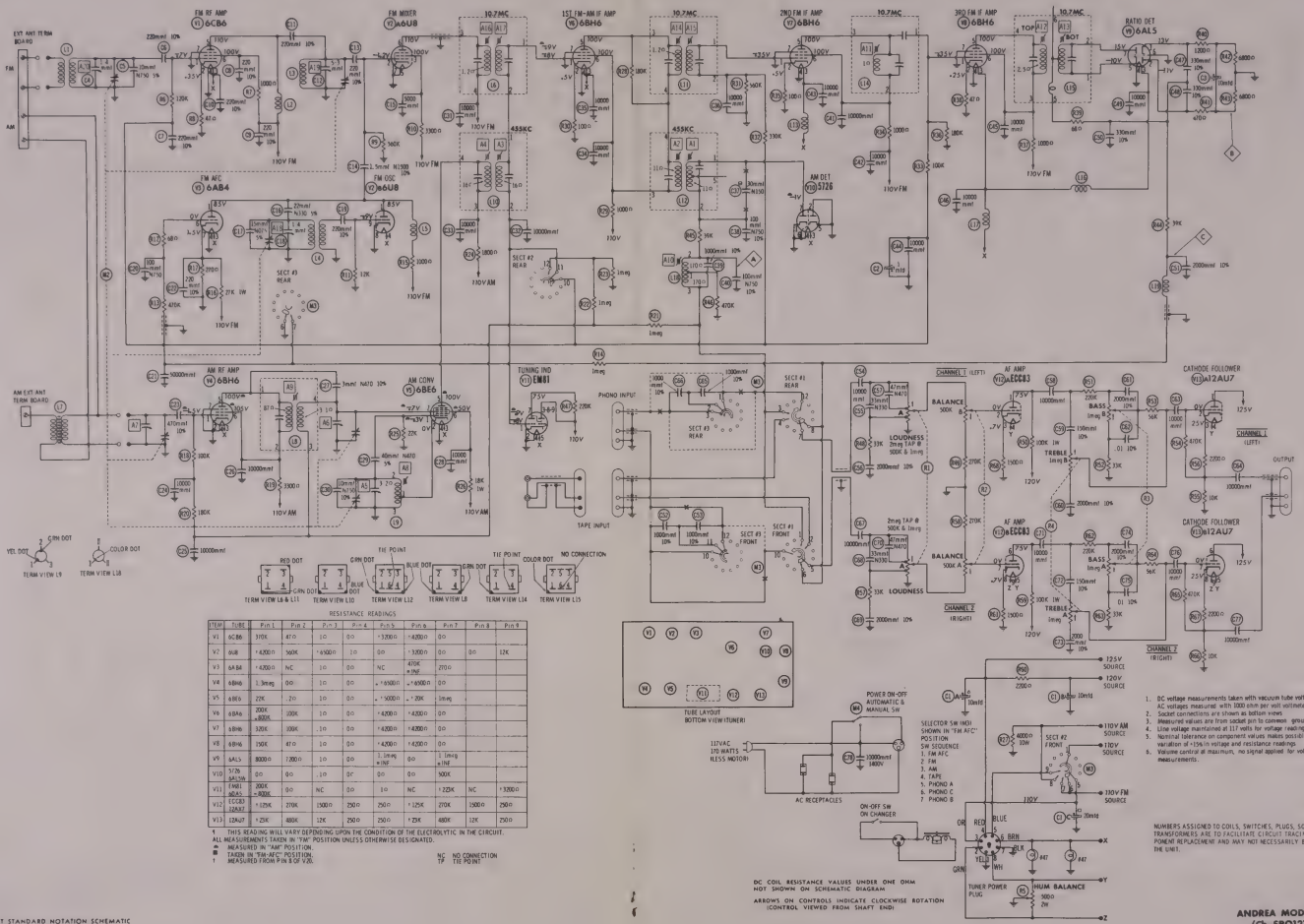
CHASSIS BOTTOM VIEW-ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS TOP VIEW-ALIGNMENT, INDUCTOR, CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	370K	47Ω	1Ω	0Ω	*3,000Ω	*4,000Ω	0Ω		
V2	6U8	*4,000Ω	560K	*6400Ω	1Ω	0Ω	*3,000Ω	0Ω	0Ω	12K
V3	6AB4	*4,000Ω	NC	1Ω	0Ω	NC	470K *INF	270Ω		
V4	6BH6	1.3meg	0Ω	1Ω	0Ω	*6400Ω	*4,400Ω	0Ω		
V5	6BE6	22K	22Ω	1Ω	0Ω	*5000Ω	*20K	1meg		
V6	6BA6	200K ±800K	200K	1Ω	0Ω	*4,000Ω	*4,000Ω	0Ω		
V7	6BH6	320K	200K	1Ω	0Ω	*4,000Ω	*4,000Ω	0Ω		
V8	6BH6	150K	47Ω	1Ω	0Ω	*4,000Ω	*4,000Ω	0Ω		
V9	6AL5	8000Ω	7,200Ω	1Ω	0Ω	1.1meg *INF	0Ω	1.1meg *INF		
V10	5726 6AL5W	0Ω	0Ω	1Ω	0Ω	0Ω	0Ω	500K		
V11	EM81 6BA5	200K ±800K	0Ω	NC	0Ω	1Ω	NC	*22K	NC	*3,000Ω
V12	6ECC83 12AX7	*125K	270K	1500Ω	250Ω	250Ω	*125K	270K	1500Ω	250Ω
V13	12AU7	*25K	480K	12K	250Ω	250Ω	*25K	480K	12K	250Ω

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
■ TAKEN IN "FM-AFC" POSITION.
† MEASURED FROM PIN 8 OF V20.

NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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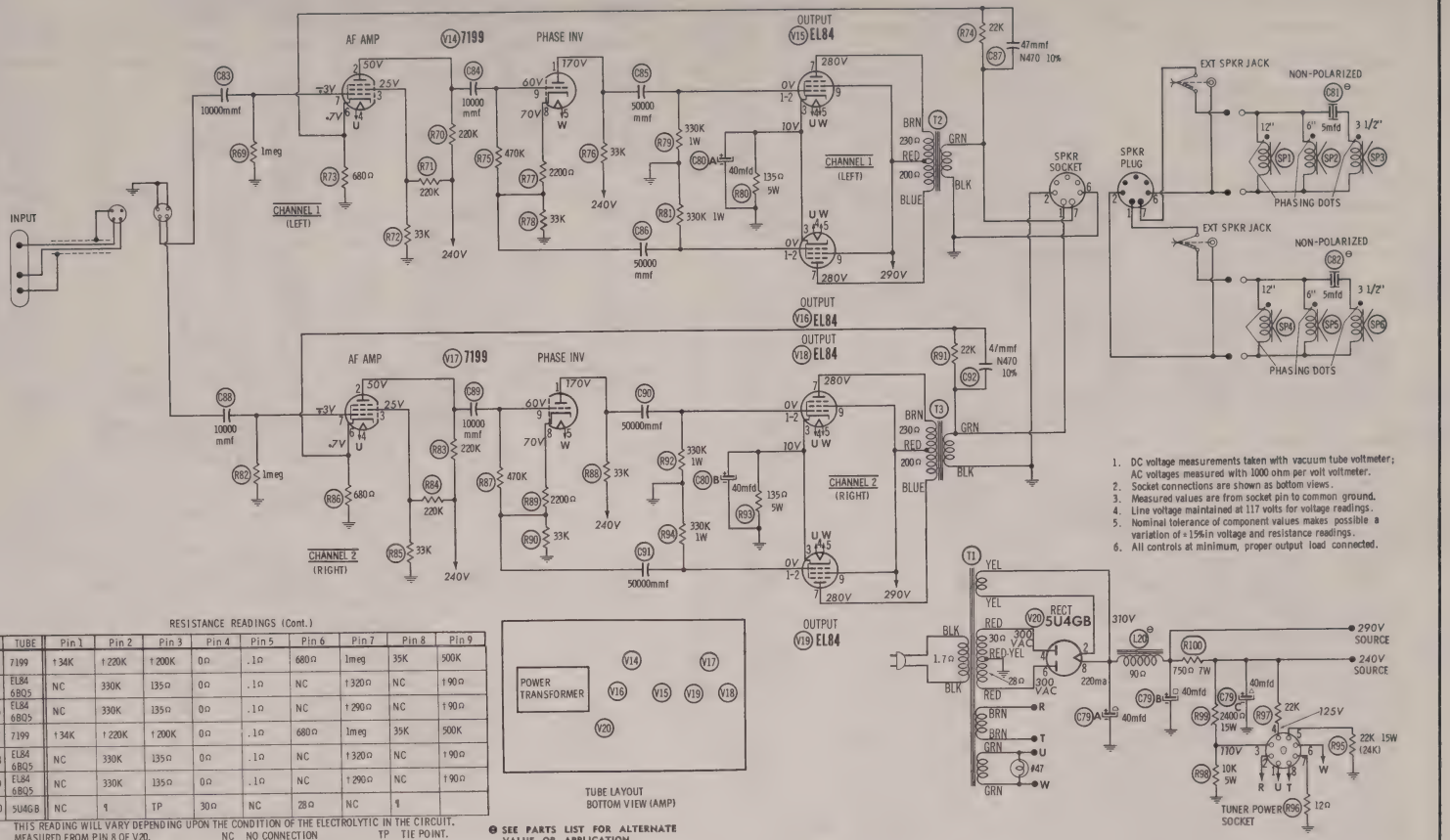
ANDREA MODEL CPR-A2S (Ch. SRQ12T-1, A2S)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS (Cont.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V14	7199	†34K	†220K	†200K	0Ω	.1Ω	680Ω	1meg	35K	500K
V15	EL84 6BQ5	NC	330K	135Ω	0Ω	.1Ω	NC	†320Ω	NC	†90Ω
V16	EL84 6BQ5	NC	330K	135Ω	0Ω	.1Ω	NC	†290Ω	NC	†90Ω
V17	7199	†34K	†220K	†200K	0Ω	.1Ω	680Ω	1meg	35K	500K
V18	EL84 6BQ5	NC	330K	135Ω	0Ω	.1Ω	NC	†320Ω	NC	†90Ω
V19	EL84 6BQ5	NC	330K	135Ω	0Ω	.1Ω	NC	†290Ω	NC	†90Ω
V20	5U4GB	NC	¶	TP	30Ω	NC	28Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V20. NC NO CONNECTION TP TIE POINT.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ANDREA MODEL CPR-A2S
(Ch. SRQ12T-1, A2S)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MAIN STEREO AMPLIFIER

ANDREA MODEL CPR-A2S

FM—AM TUNER PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CB6
V2	FM Mixer-FM Osc.	6U8
V3	FM AFC	6AB4
V4	AM RF Amplifier	6BH6
V5	AM Converter	6BE6
V6	1st FM-AM IF Amp.	6BH6
V7	2nd FM IF Amplifier	6BH6
V8	3rd FM IF Amplifier	6BH6
V9	Ratio Detector	6AL5
V10	AM Detector	5726/6AL5W
V11	Tuning Indicator	EM81/6DA5
V12	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83/12AX7
V13	Channel 1 Cathode Foll. Channel 2 Cathode Foll.	12AU7

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	ANDREA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲10	450	HCE-1356	AFH3-35	C0260	FP376.3	TMT-3715	TVL-3779	
B	10	450							
C	■20	450							
C2	1	25	HCE-1358	PRS1300	BBR1-50	TC31	TD-1-50	TVA-1300	
C3	10	50	HCE-1357	PRS1320	BBR10-50	TC32	TD-10-50	TVA-1304	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1-4			829-4		CV-2	CT551	
C5	10 N750 5%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C6	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C7	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C8	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C9	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C10	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C11	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C12	.5-3			829-3		CV-1	CT565	
C13	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C14	1.5 N1500 10%	#HCC-1964				*		
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C16	22 N330 5%	#HCC-1983				*		10TCS-Q22
C17	15 N075 5%	#HCC-1981				*		
C18	1-4			829-4		CV-2	CT551	
C19	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C20	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C21	50000		BPD-05	DD-503	CUB2S5	4DP-3-503	GP150	5HK-S50
C22	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C23	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	3 N470 10%					*		
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	40 N470 5%	#HCC-1972				*		
C30	10 N750 10%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	30 N150	Note 1				*		10TCP-Q33
C38	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C39	1000 10%		D1-1000	DD-102	5R5T1	CCD-102	GP210	10TS-D10
C40	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C41	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C47	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C48	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	330 10%			DD-331	L10T33	CCD-331	GP333	10TS-T33
C51	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C52	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C53	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C54	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C55	33 N330	#HCC-1962				*		10TCS-T33
C56	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C57	47 N470	#HCC-1961				*		
C58	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C59	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C60	2000 10%		DI-2000		5R5D2	CCD-203	GP220	10TS-D20
C61	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C62	.01 100V 10%		V84C2S1-10%		PM4S1	1DP-1-103		4TM-S10
C63	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C64	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C65	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C66	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C67	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	33 N330	#HCC-1962				*		10TCS-T33
C69	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C70	47 N470	#HCC-1961				*		
C71	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C72	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C73	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C74	2000 10%		DI-2000		5R5D2	CCD-202	GP220	10TS-D20
C75	.01 100V 10%		V84C2S1-10%		PM4S1	1DP-1-103		4TM-S10
C76	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C77	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C78	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.
\# Andrea Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ANDREA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg *		GRV-884	BT-175				Loudness, Right Channel
B	2meg *			STR-175				Loudness, Left Channel
R2A	500K		GRV-886	B-59	AD47-500K-B		FA55L	Balance, Right Channel
B	500K			SR-59	Not Req.		RU55L	Balance, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	1meg		GRV-885	B-70	AD47-1meg-Z		FA16A	Bass, Right Channel
B	1meg			SR-70	Not Req.		RU16A	Bass, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	1meg		GRV-885	B-70	AD47-1meg-Z		FA16A	Treble, Right Channel
B	1meg			SR-70	Not Req.		RU16A	Treble, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R5A	500Ω	2(WW)	GRV-856	WN-501	A43-500	WPS500	R500L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

* Taps @ 500K & 1meg.

FM–AM TUNER PARTS LIST (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	120K	
R7	1000Ω	
R8	47Ω	
R9	560K	
R10	3300Ω	
R11	12K	
R12	68Ω	
R13	470K	
R14	1meg	
R15	1000Ω	
R16	27K 1W	
R17	270Ω	
R18	100K	
R19	3300Ω	
R20	180K	
R21	1meg	
R22	1meg	
R23	1meg	
R24	1800Ω	
R25	22K	
R26	18K 1W	

ITEM No.	RATING	REMARKS
R27	4000Ω 10W	IRC#PW10-4000Ω
R28	180K	
R29	1000Ω	
R30	100Ω	
R31	560K	
R32	330K	
R33	100K	
R34	1000Ω	
R35	100Ω	
R36	180K	
R37	1000Ω	
R38	47Ω	
R39	68Ω	
R40	1200Ω	
R41	470Ω	
R42	6800Ω	
R43	6800Ω	
R44	39K	
R45	39K	
R46	470K	
R47	220K	

ITEM No.	RATING	REMARKS
R48	33K	
R49	270K	
R50	100K 1W	
R51	220K	
R52	33K	
R53	56K	
R54	470K	
R55	10K	
R56	2200Ω	
R57	33K	
R58	270K	
R59	100K 1W	
R60	2200Ω	
R61	1500Ω	
R62	220K	
R63	33K	
R64	56K	
R65	470K	
R66	10K	
R67	2200Ω	
R68	1500Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ANDREA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	FM Ant. Trans.	SA-412				* Drill New Mounting Hole.
L2	RF Choke (3.3uh)	SA-415	BC-564	4608	RTC-8518	
L3	FM RF Coil	SA-413				
L4	FM Osc. Coil	SA-414				
L5	RF Choke (3.3uh)	SA-415	BC-564	4608	RTC-8518	
L6	1st FM IF Trans.	SA-408	FM-254	1463	RTC-8599	
L7	Loopstick	SA-402	BC-419	705-A		
L8	AM RF Trans.	SA-403	BC-388 *			
L9	AM Osc. Coil	SA-404	BC-393	70-OSC	RTC-8647	
L10	1st AM IF Trans.	SA-405	BC-352	12-C1	RTC-8632	
L11	2nd FM IF Trans.	SA-409	FM-254	1463	RTC-8599	
L12	2nd AM IF Trans.	SA-406	BC-353	12-C2	RTC-8632	
L13	Fil. Choke (2uh)	SA-416	BC-563	4606	RTC-8517	
L14	3rd FM IF Trans.	SA-410				
L15	Ratio Detector	SA-411	FM-255	1465	RTC-8600	
L16	Fil. Choke (2uh)	SA-416	BC-563	4606	RTC-8517	
L17	Fil. Choke (2uh)	SA-416	BC-563	4606	RTC-8517	
L18	10KC Filter (5uh)	SA-406				
L19	RF Choke		SW-631	4609	RTC-8519	

PHONO CARTRIDGE & NEEDLES

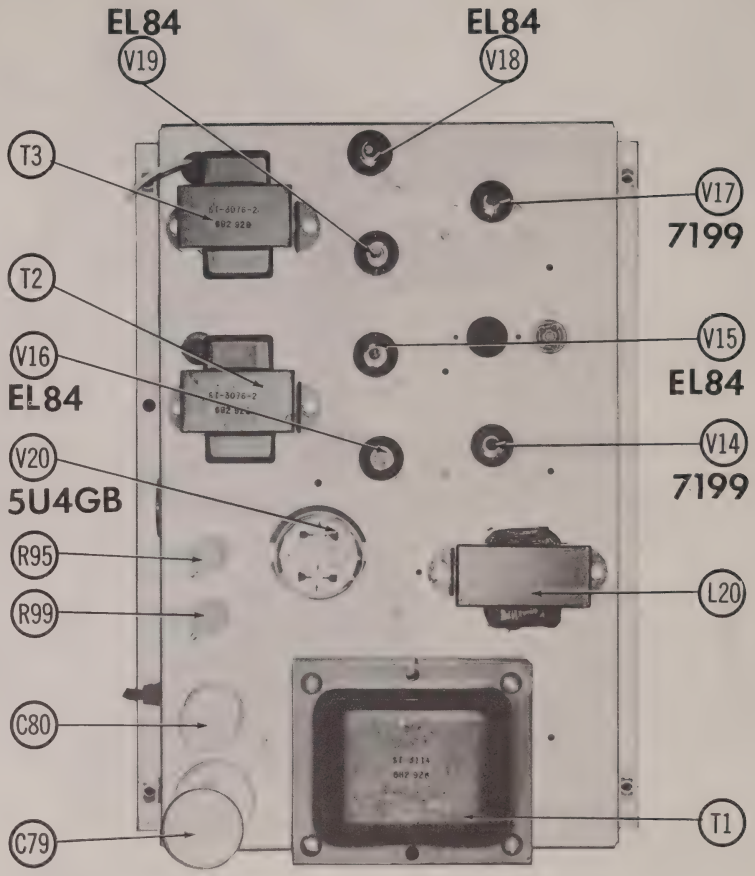
*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	ANDREA PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	FM-5554	FM-5554-1* (78 RPM) FM-5554-2* (LP)	13TB	Not Req.	26S	S1-1 * & S3-3*	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	ANDREA PART No.	NOTES
M2	Tuning Cap.	HCV-2128	3 Gang (Ant. 29–435mmf, RF 22–425mmf, Osc. 24–197mmf)
M3	Switch	FM-5615	Function Selector (Rotary Wafer Type)
M4	Switch	FM-5616	Power, Auto-Manual

AMP CHASSIS—TOP VIEW



AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V14	Channel 1 AF Amp. - Phase Inverter	7199
V15	Channel 1 Output	EL84/6BQ5
V16	Channel 1 Output	EL84/6BQ5
V17	Channel 2 AF Amp. - Phase Inverter	7199
V18	Channel 2 Output	EL84/6BQ5
V19	Channel 2 Output	EL84/6BQ5
V20	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	ANDREA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C79A	▲40	450	HCE-1364	AFH3-44	C0350	FP377	TMT-3748	TVL-3787	
B	■40	450							
C	▲40	450							
C80A	40	25	HCE-1366	AFH2-04	B0060	WP201.1	TMD-2030	TVL-2210	
B	40	25							
C81	5	10NP		PRS7405	BBR4-150	TCN105		TVANS-1110 *	①
C82	5	10NP		PRS7405	BBR4-150	TCN105		TVANS-1110 *	①

① Some versions may use 6mfdⓐ 10NP Part # HCE-1343 in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C83	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C84	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C85	50000		BPD-05	DD-503	CUB685	6DP-3-503	GP150	5HK-S50
C86	50000		BPD-05	DD-503	CUB685	6DP-3-503	GP150	5HK-S50
C87	47 N470 10%					*		
C88	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C89	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C90	50000		BPD-05	DD-503	CUB685	6DP-3-503	GP150	5HK-S50
C91	50000		BPD-05	DD-503	CUB685	6DP-3-503	GP150	5HK-S50
C92	47 N470 10%					*		

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R69	1meg	
R70	220K	
R71	220K	
R72	33K	
R73	680Ω	
R74	22K	
R75	470K	
R76	33K	
R77	2200Ω	
R78	33K	
R79	330K 1W	
R80	135Ω 5W	Pt. #GRW-567 IRC #PW5-135Ω
R81	330K 1W	
R82	1meg	
R83	220K	
R84	220K	
R85	33K	
R86	680Ω	
R87	470K	
R88	33K	
R89	2200Ω	
R90	33K	
R91	22K	
R92	330K 1W	
R93	135Ω 5W	Pt. #GRW-567 IRC #PW5-135Ω
R94	330K 1W	
R95	22K 15W	(24K) *
R96	12Ω	
R97	22K	
R98	10K 5W	Pt. #GRW-563 IRC #PW5-10KΩ
R99	2400Ω 15W	Pt. #GRW-562 IRC #PW20-2.4K
R100	750Ω 7W	Pt. #GRW-561 IRC #PW10-750Ω

* Alternate Value.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ANDREA PART No	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L20	.220A	90Ω	2 HY	ST-3078①	C-2991	C-2326②	26C44	C-21X	

① Alternate Part #ST-3078-1. ② Drill New Mounting Hole.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ANDREA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117Vⓐ 1.5A	600VCT ⓐ .220A	5Vⓐ 3A	ST-3114	P-2836		26R91		
	SEC. 3	SEC. 4	SEC. 5						
	6.3Vⓐ .6A	6.3Vⓐ 7A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ANDREA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6500Ω CT	3-4Ω	ST-3076-2	A-2901	A-3823	24S07	S-53X	
T3	6500Ω CT	3-4Ω	ST-3076-2	A-2901	A-3823	24S07	S-53X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ANDREA PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	SL-4049	12A4AZ6.2	
SP2	6"	PM	6-8Ω	SL-4034-1	6A3IZ6.4	
SP3	3½"	PM	3-4Ω	SL-4033	3AI5TZ3.4	
SP4	12"	PM	6-8Ω	SL-4035-1	12A4AZ6.2	
SP5	6"	PM	6-8Ω	SL-4034-1	6A3IZ6.4	
SP6	3½"	PM	3-4Ω	SL-4033	3AI5TZ3.4	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	FM-5503	
Dial Pointer	FM-5502	
Knob	FM-5624	

PHOTOFACT® Folder

ARKAY
MODEL A-12

ARKAY
MODEL A-12

ARKAY
MODEL A-12

TRADE NAME	Arkay Model A-12
MANUFACTURER	Arkay International, Inc., 88-06 Van Wyck Expressway, Jamaica 18, N. Y.
TYPE SET	AC Operated 5 Tube Audio Amplifier
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 66 Watts, .62 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KX205

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Preamp. -AF Amp.	6SC7
V2	AF Amp. -Phase Inv.	6SL7GT
V3	Output	6V6GT
V4	Output	6V6GT
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ARKAY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	1248	AFH3-44	C0350	FP377	TMT-3748	TVL-3787	
B	■40	450							
C	▲40	450							
C2	50	50		PRS1350	BR505	TC39	TD-50-50	TVA-1308	Note 1

Note 1. Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

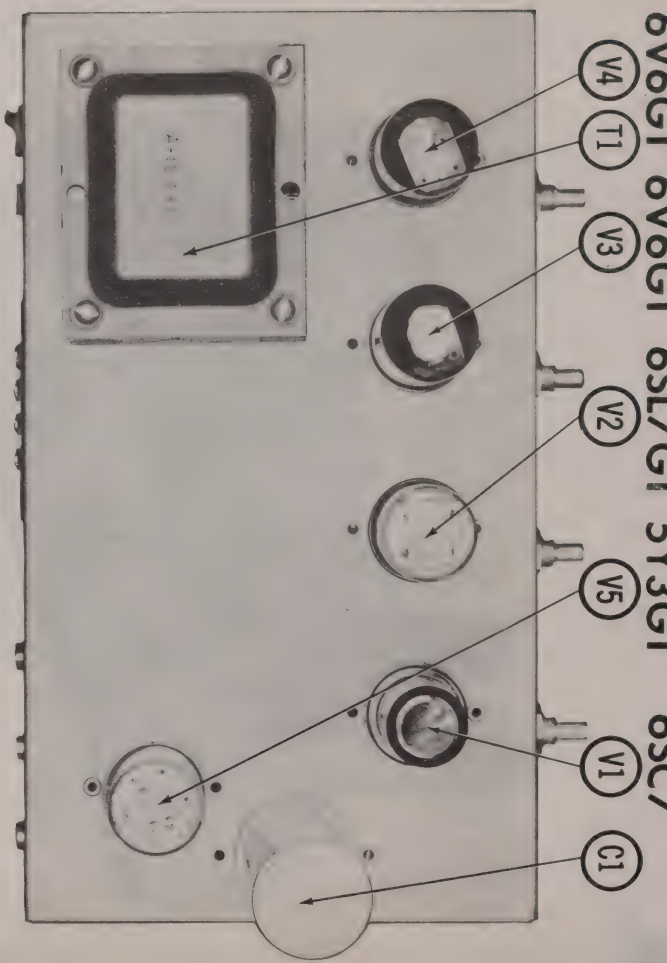
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C4	270	Note 1	DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C5	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C6	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C7	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C8	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C9	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C10	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C11	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C12	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C13	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C15	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C16	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C17	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARKAY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	1621	B-69	A47-1meg-S	Q11-137	U54	Loudness
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	1meg	½	1621	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	1620	B-60-S	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	2.2meg	
R5	47K	
R6	3.3meg	
R7	220K	
R8	10meg	
R9	220K	
R10	47K	

ITEM No.	RATING	REMARKS
R11	15K	
R12	220K	
R13	220K	
R14	2200Ω	
R15	470K	
R16	100K	
R17	100K	

ITEM No.	RATING	REMARKS
R18	220K	
R19	220K	
R20	250Ω 7W	IRC#PW10-250Ω
R21	100Ω	
R22	10Ω	
R23	47K 1W	
R24	4700Ω 2W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
				ARKAY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	PRI.	SEC. 1	SEC. 2						
T1	117V @ .62A	680VCT @ .080A	5V @ 2A	A-12 F & V①					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 1.9A								

① Alternate Part #51F1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
			ARKAY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	PRI.	SEC.						
T2	7200Ω CT	16Ω Tap @ 8Ω, 4Ω	55F3			26S59		

MISCELLANEOUS

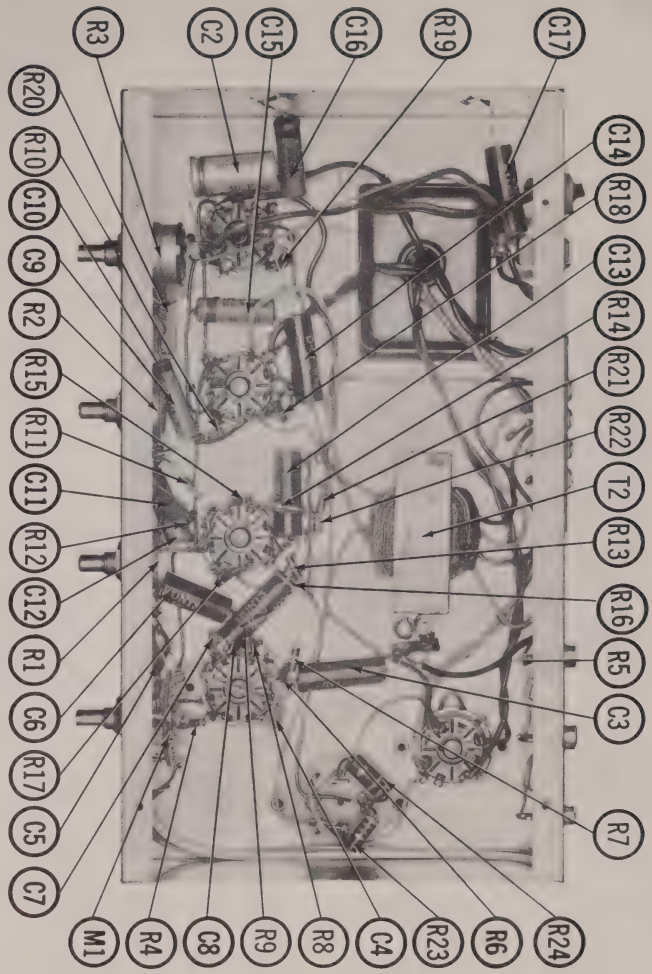
ITEM No.	PART NAME	ARKAY PART No.	NOTES
M1	Switch		Function Selector

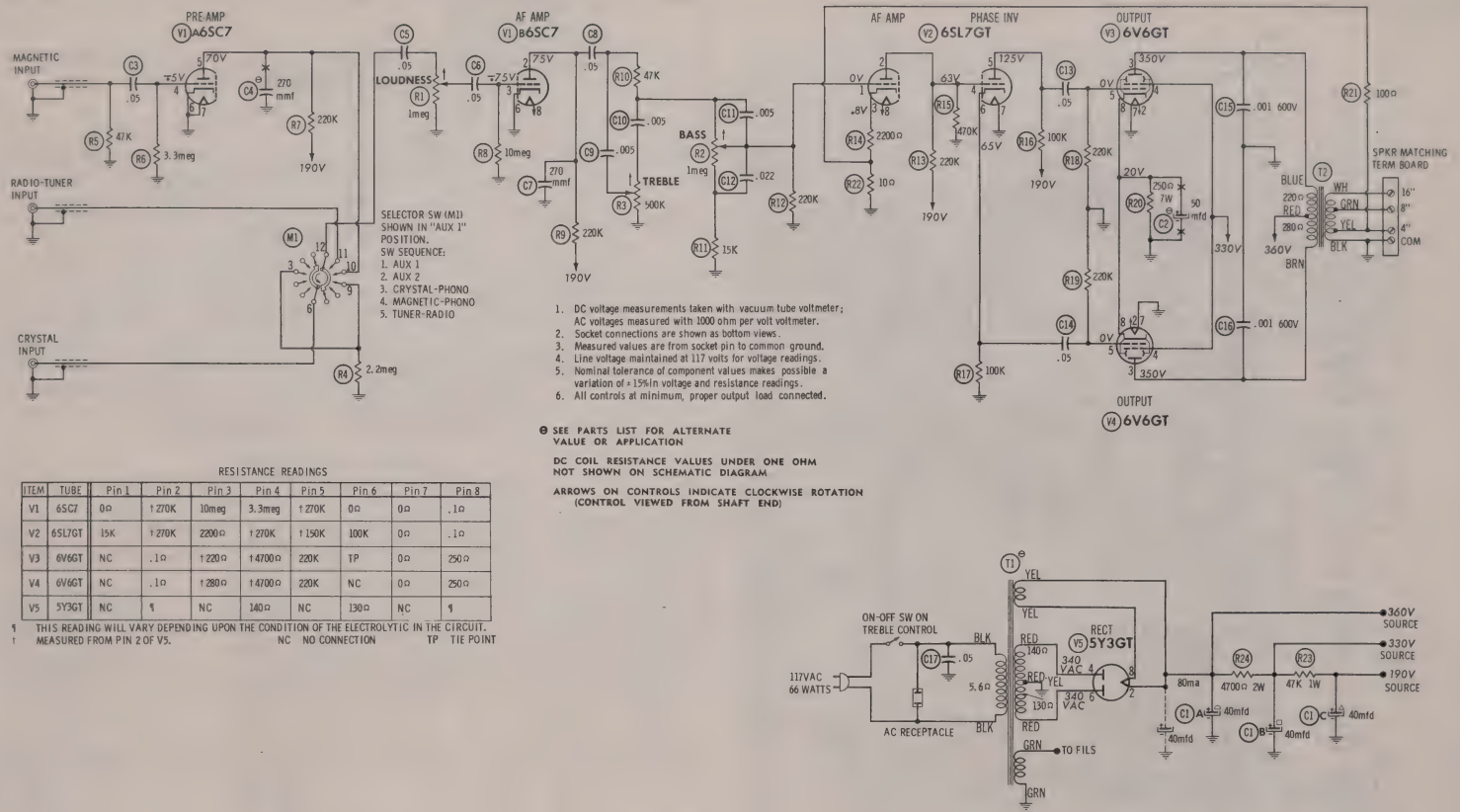
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6SC7	0Ω	†270K	10meg	3.3meg	†270K	0Ω	0Ω	.1Ω
V2	6SL7GT	15K	†270K	2200Ω	†270K	†150K	100K	0Ω	.1Ω
V3	6V6GT	NC	.1Ω	†220Ω	†4700Ω	220K	TP	0Ω	250Ω
V4	6V6GT	NC	.1Ω	†280Ω	†4700Ω	220K	NC	0Ω	250Ω
V5	5Y3GT	NC	¶	NC	140Ω	NC	130Ω	NC	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V5. NC NO CONNECTION TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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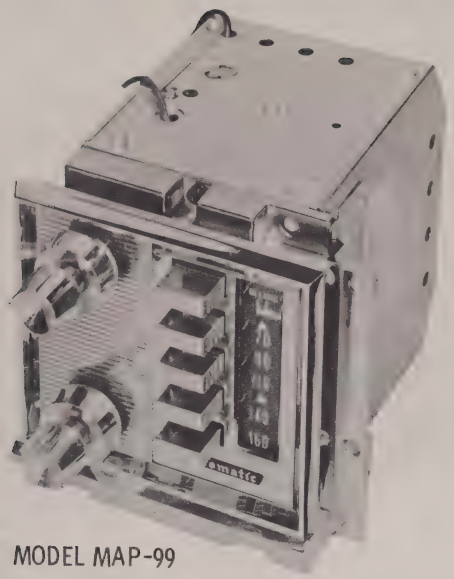
ARKAY MODEL A-12

PHOTOFACT® Folder

AUTOMATIC MODELS MAP-99, MT-419, MT-530

AUTOMATIC MODELS MAP-99, MT-419, MT-530



MODEL MAP-99

TRADE NAME	Automatic Models MAP-99, MT-419(Late Production), MT-530 (For 1959-1960 Mercury)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube - 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.2 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	538 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4.. GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	265KC (400% Mod.)	1610KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	Thru dummy (Fig. 1) to antenna receptacle.	"	1610KC Signal.	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull Pushbutton out.
2. Tune manually to desired station.
3. Press Pushbutton in firmly.
4. Repeat for remaining Pushbuttons.

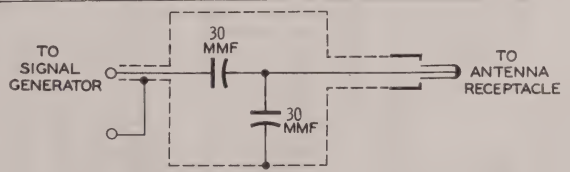


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD283

SET 516 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12EK6 (12BL6) *	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12AE6A

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	6D122	Driver		2N362		PNP
X2	8L201	Output				PNP Note 1

Note 1. When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	500	16		PRS2020		TCD16		TVAS-2150 *	Note 1
B	100	16							
C2	750	3	20-757	SRE3V500	BR1000-6	PETA190	TD-1000-6	TVAS-1097*	

Note 1. Some versions may use 500-500mfd in this application (Part #20-1167).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800L						
C4	40 NPO		NPO-DI 39		C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5A		#28-4046						
B								
C								
C6	5		DI 5.0	DD-050	L10V5	CCD-050	GP550	10TS-V50
C7	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C8	27		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C9	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	10TS-S10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	10TS-S10
C12	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	10TS-D30
C13	.047 200V	Note 1	P288N-047	DD-503	DPMS2S47	4DP-3-473	GEM-4147	2TM-S47
C14	.047 200V	(3000) †	P288N-047	DD-503	DPMS2S47	4DP-3-473	GEM-4147	2TM-S47

Automatic Part Number.
Note 1. Not used in some versions.
† Alternate Value.

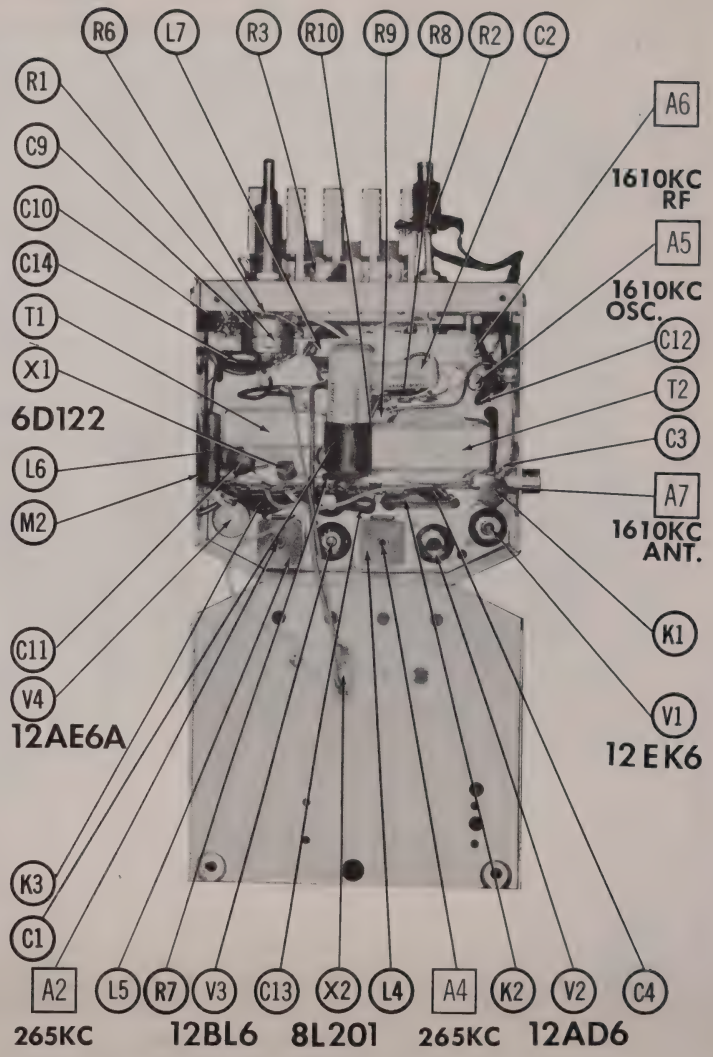
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	½	80A1050	F1-68				Tone
B	1meg	½		R2-60		† QJ-1143A	■ UE4165-S	Volume
	650K Tap							
C	Bushing			AK-28				
D	Switch			KR-7				Power Off-On
R2	25Ω	2(WW)	80A1052					Fader
R3	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias
	100Ω Stop							

† "CONCENTRIKIT" equivalent: K-8 Kit with base elements and shafts: B13-139, P14-121 (Panel)
B19-137X, R1-202 (Rear)
S-24 (Bushing)
76-2 (Switch)

■ "STA-LOC" equivalent: FR26A, RU16T654, OS1625, IS2125, US42.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	47K	
R5	1.2meg	
R6	220K	(100K) *

ITEM No.	RATING	REMARKS
R7	220Ω	
R8	22Ω	
R9	1.0Ω 1W	

ITEM No.	RATING	REMARKS
R10	220Ω	
R11	47K	

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA.
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Sprague PRC-9
K2	RF Converter Bias	3000mmf, 10000mmf, 47000mmf, 150Ω, 150K, 2.2meg, 4.7meg, 10meg, 10meg	89-591	Sprague DT-14
K3	Audio Coup. Net.	10000mmf, 120Ω, 6800Ω, 12K, 470K, 2.2meg	89-592	Sprague F-3

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AUTOMATIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Ant. Coil	①				
L2	RF Coil	①				
L3	Osc. Coil	①				
L4	Input IF Trans.	14-265X	BC-350	12-H1	RTC-8638	
L5	Output IF Trans.	14-267X	BC-354	12-H6	RTC-8640	
L6	"A" Lead Hash Choke	14-205 ②		5220	RTC-9182	10uh

① Part of Tuner Assembly M1.
② Not used in some versions.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L7	1.2A	.6Ω	.009HY	75A6001 ①					①Alternate Part #75A601

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	SEC.	REPLACEMENT DATA AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	13	1	75A1303					

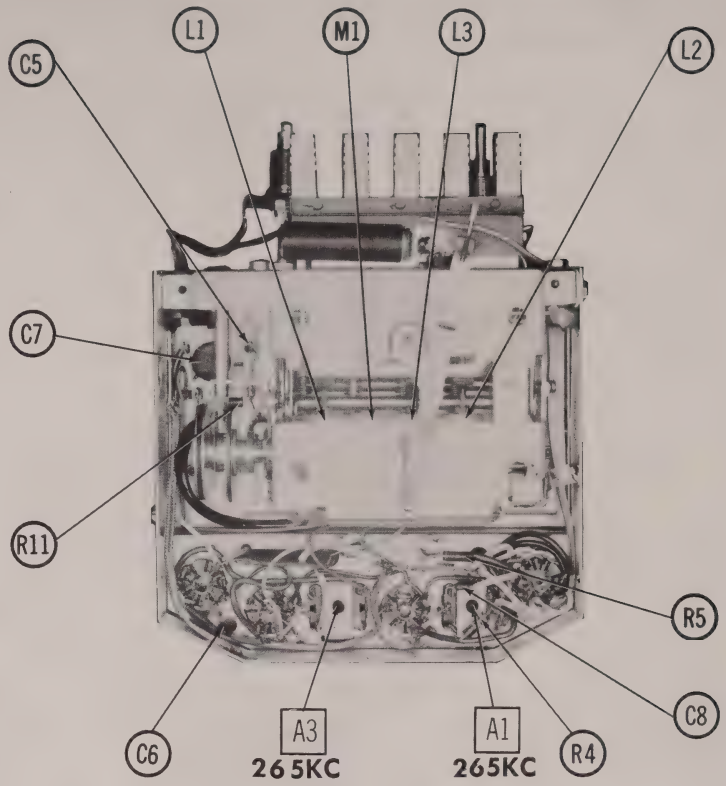
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	20Ω Tap ② 3-4Ω	75A1306					

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA AUTOMATIC PART No.	QUAM PART No.	NOTES
SP1	6"x 9"	PM	3-4Ω	73C1171	69A2	
	5"x 9"	PM	3-4Ω	73B1171 *	69A1	* Used in some versions.

CHASSIS—BOTTOM VIEW

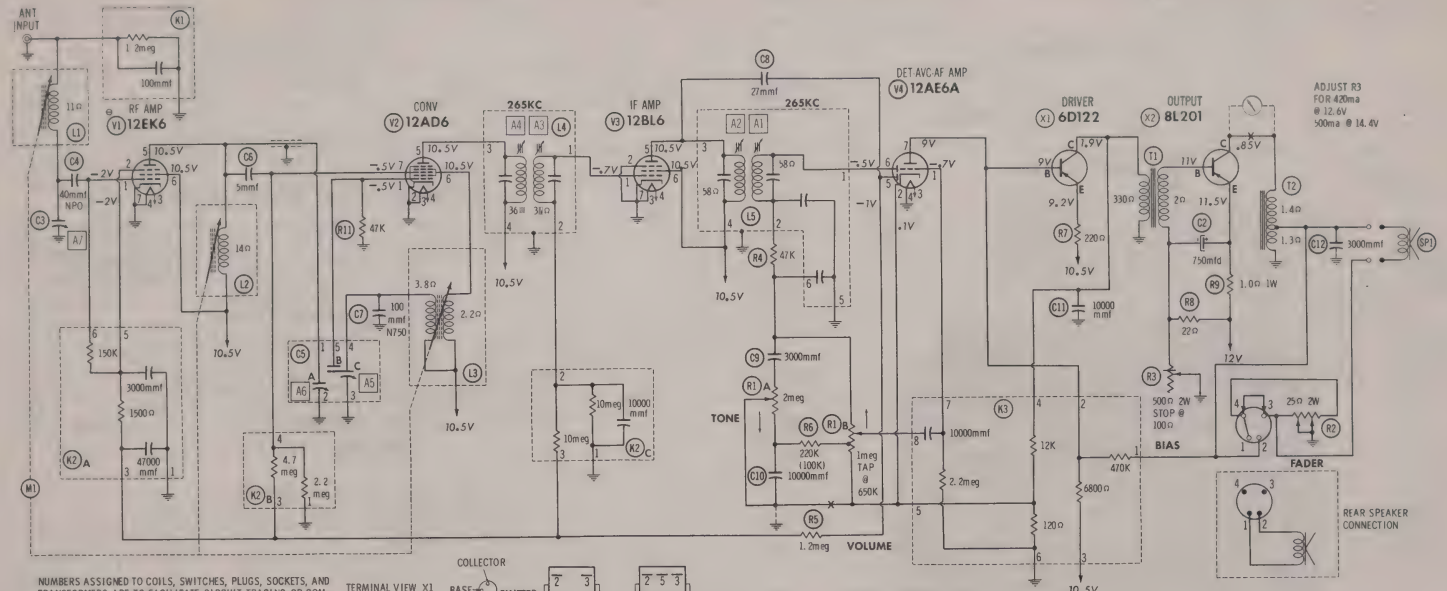


MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M1	Tuner	78B1051	Pushbutton Type
M2	Spark Plate		

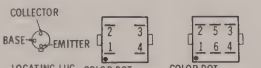
WIRING DATA

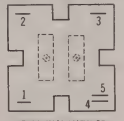
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



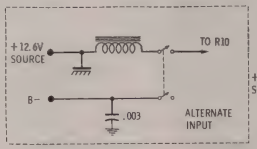
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

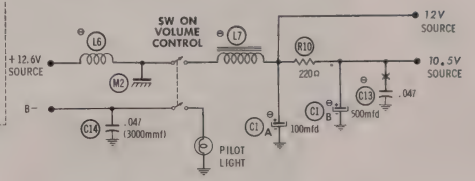
TERMINAL VIEW X1





TERMINAL VIEW C5





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12EK6	6.1meg	6meg	.1Ω	0Ω	230Ω	220Ω	0Ω
V2	12AD6	47K	0Ω	0Ω	.1Ω	255Ω	220Ω	2.2meg
V3	12BL6	6.8meg	0Ω	.1Ω	0Ω	280Ω	220Ω	0Ω
V4	12AE6A	2.2meg	120Ω	.1Ω	0Ω	7meg	1meg	6800Ω

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

TERMINAL VIEW X2

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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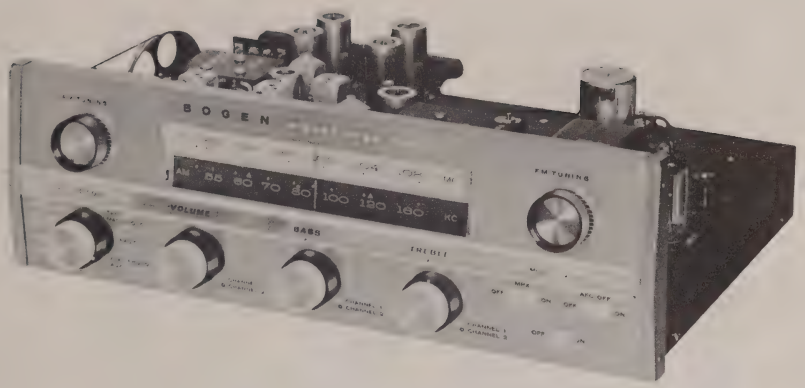
AUTOMATIC MODELS MAP-99, MT-419, MT-530

PHOTOFACT® Folder

**BOGEN
MODEL STP52**

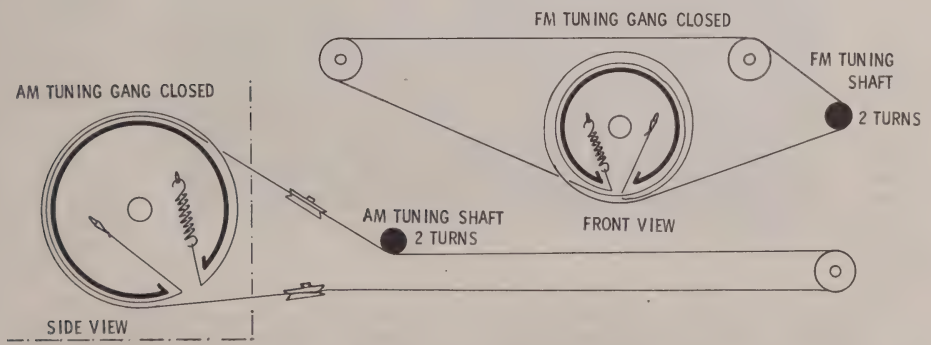
BOGEN
MODEL STP52



BOGEN
MODEL STP52

TRADE NAME	Bogen Model STP52		
MANUFACTURER	Bogen-Presto Co., A Div. of The Siegler Corp., P.O. Box 500, Paramus, N. J.		
TYPE SET	AC Operated 12 Tube FM-AM Tuner With Stereo Preamplifier		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	52 Watts, .5 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	520 - 1640KC	FREQ. MOD.	88 — 108MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KL341

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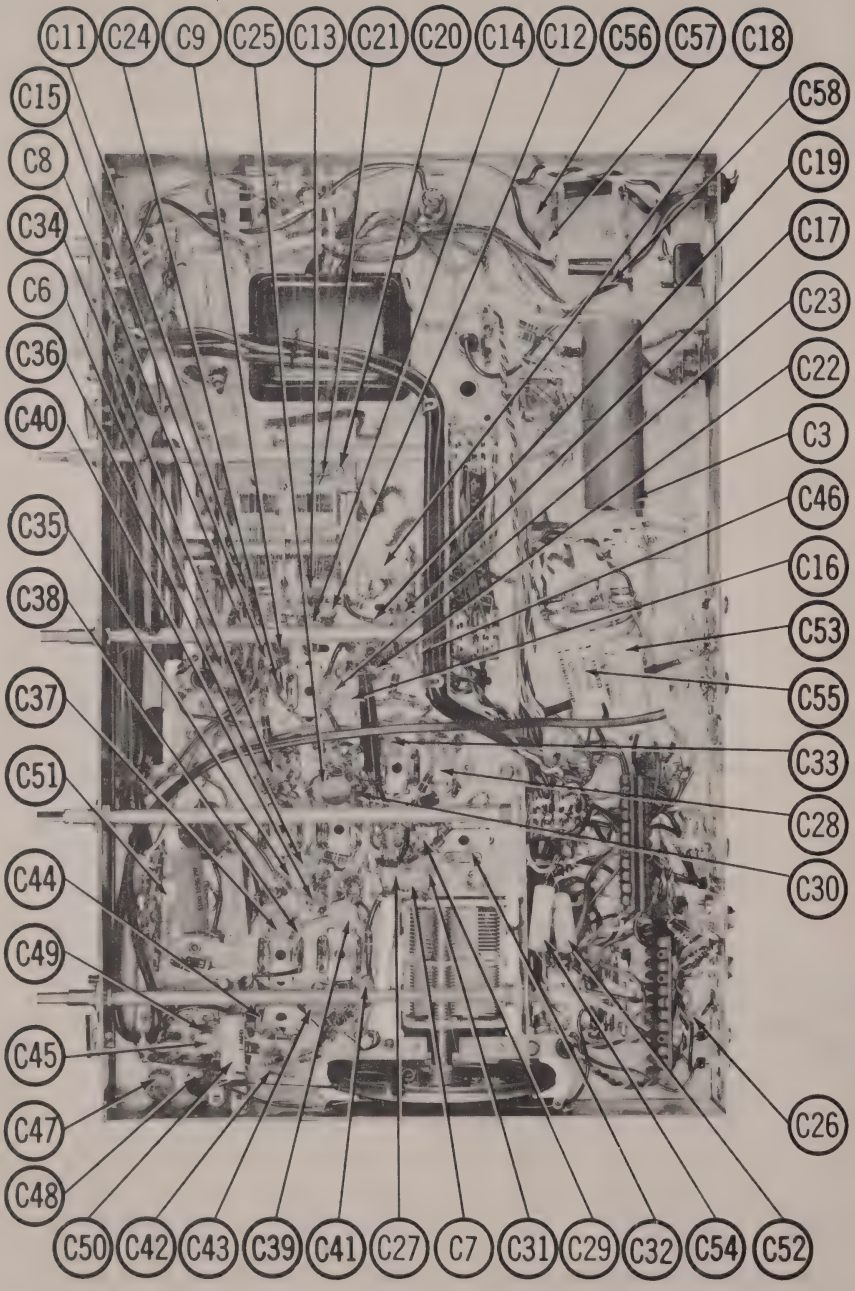
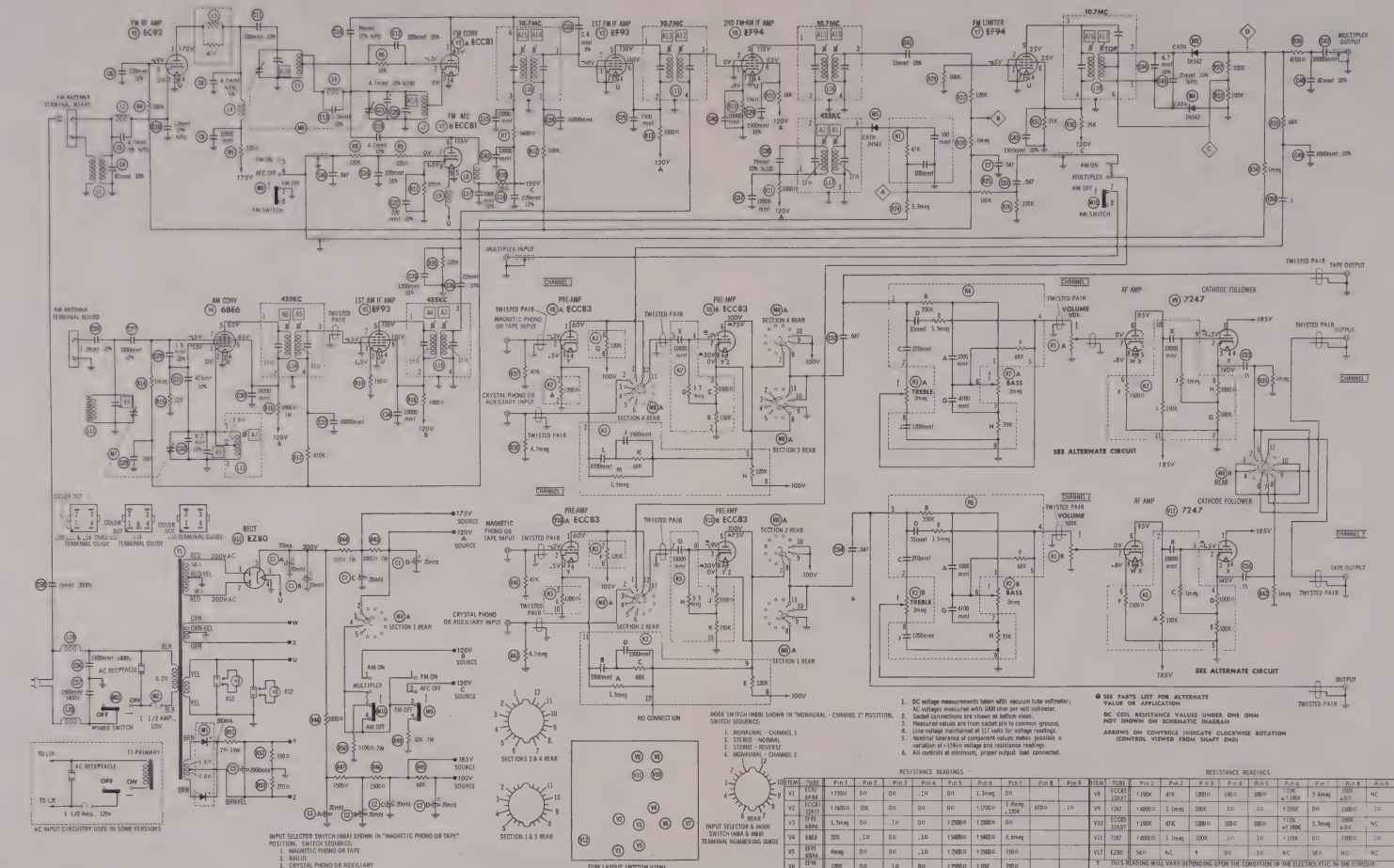
SET 516 FOLDER 8



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EW9 6AV6	170Ω	0Ω	0Ω	.1Ω	0Ω	1.3meg	0Ω		
V2	ECC83 12AX7	160Ω	10K	0Ω	0Ω	0Ω	100Ω	1.4meg + 220K	470Ω	.1Ω
V3	EF93 6BA6	1.3meg	0Ω	.1Ω	0Ω	250Ω	250Ω	0Ω		
V4	6BE6	22K	.1Ω	0Ω	.1Ω	540Ω	540Ω	4.6meg		
V5	EF95 6BA6	4meg	0Ω	0Ω	.1Ω	250Ω	250Ω	150Ω		
V6	6EW9 6AV6	120K	0Ω	.1Ω	0Ω	250Ω	120K	250Ω		
V7	6EW9 6AV6	100K	0Ω	.1Ω	0Ω	135K	135K	0Ω		

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	ECC83 12AX7	190K	47K	1200Ω	100Ω	100Ω	170K ‡ 135K	3.4meg	250K ±0Ω	NC
V9	7247	400Ω	1.1meg	100K	1Ω	1Ω	135K	0Ω	1000Ω	1Ω
V10	ECC83 12AX7	190K	47K	1200Ω	100Ω	100Ω	172K ‡ 190K	3.3meg	240K ±0Ω	NC
V11	7247	400Ω	1.1meg	100K	1Ω	1Ω	135A	0Ω	1500Ω	1Ω
V12	EZ80	540	NC	1	0Ω	1Ω	NC	540	NC	NC

‡ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS MADE IN "STEREO RADIO" POSITION UNLESS OTHERWISE DESIGNATED.
● MEASURED IN "MAG PHONO" POSITION.
▲ MEASURED WITH AFC SW (MR) IN "OFF" POSITION.
NC NO CONNECTION
† MEASURED FROM PIN 3 OF V12.
■ MEASURED FROM CATHODE.

MEMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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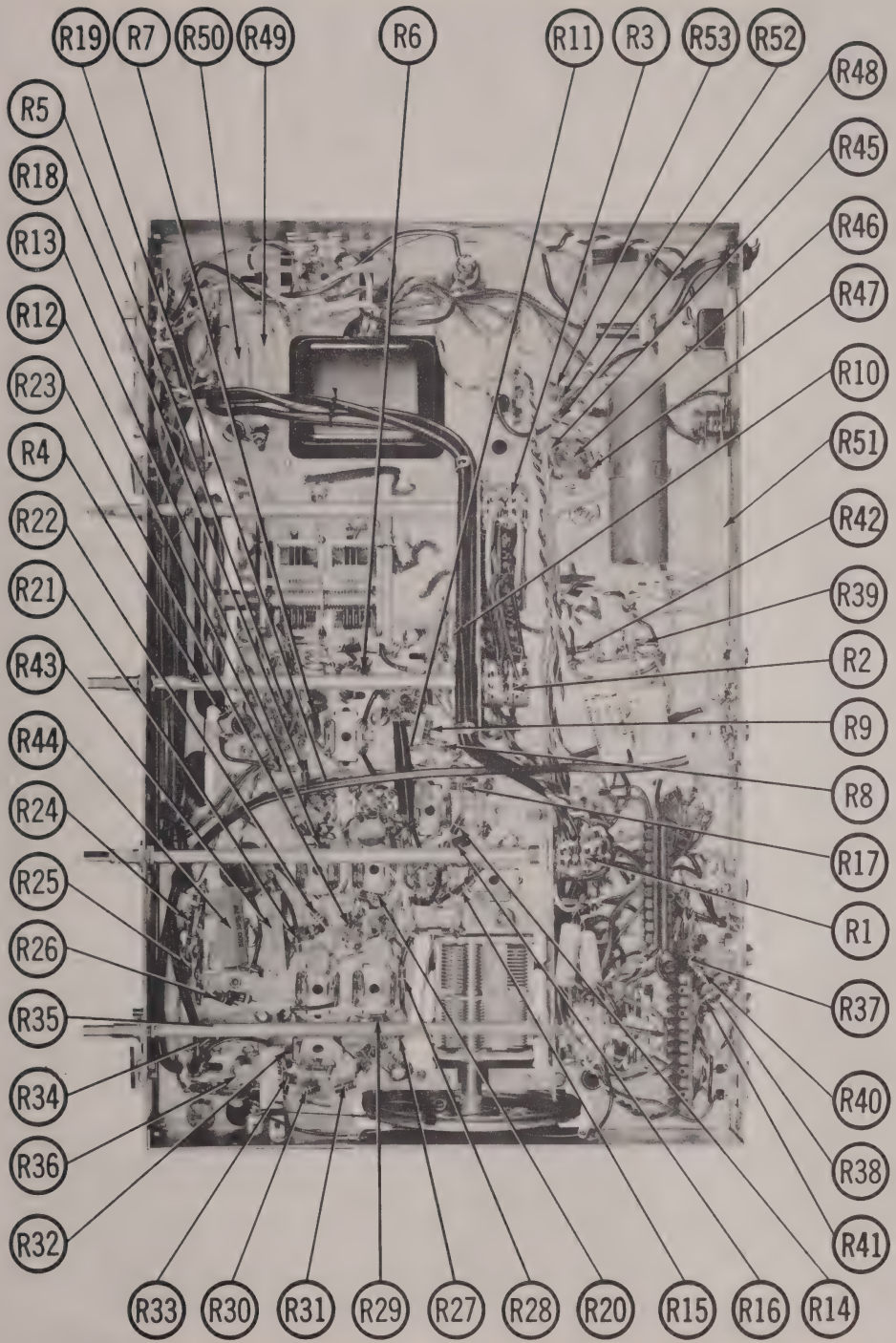
BOGEN MODEL STP52



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 Thru A6, A10 thru A13, A16, A17	GENERAL CEMENT #5097, 8727 WALSCO #2515
A7	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A8, A9, A19	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A14, A15	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532
A18	GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	High side thru .01mfd to AM antenna terminal. Low side to chassis.	600KC	600KC	"	A7	"
3.	"	1500KC	1500KC	"	A8, A9	Adjust for maximum deflection. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point Ⓒ. Common to chassis.	A16	"
6.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulation signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. amp. thru 47K to point Ⓒ. Low side to chassis.	A16	"
6.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A17	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

AFC "Off".

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 120Ω in each lead.	105MC (Unmod.)	(FM) 105MC	DC probe to point Ⓑ. Common to chassis.	A18, A19	Adjust for maximum deflection.
8.	"	90MC	90MC	"		Check Tracking.

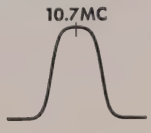
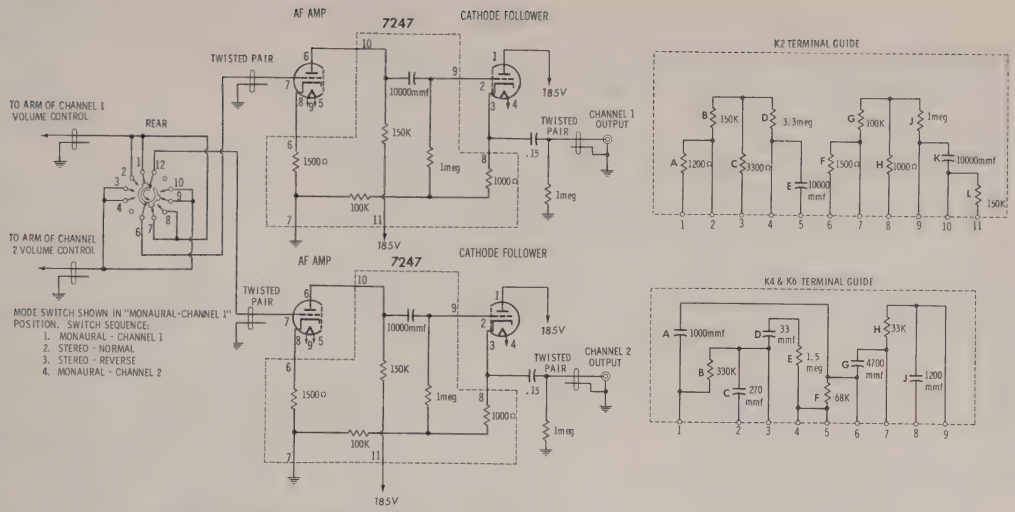
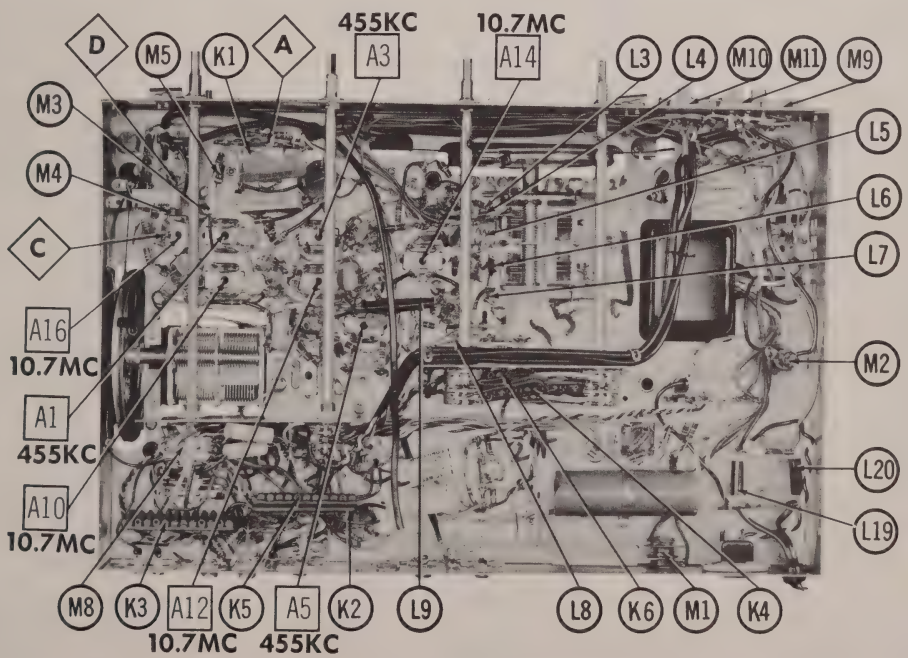


FIG. 1

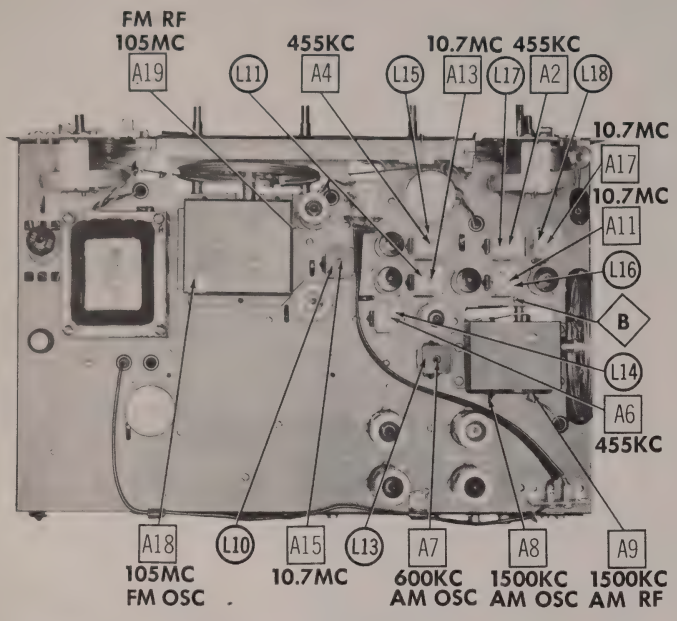
FIG. 2



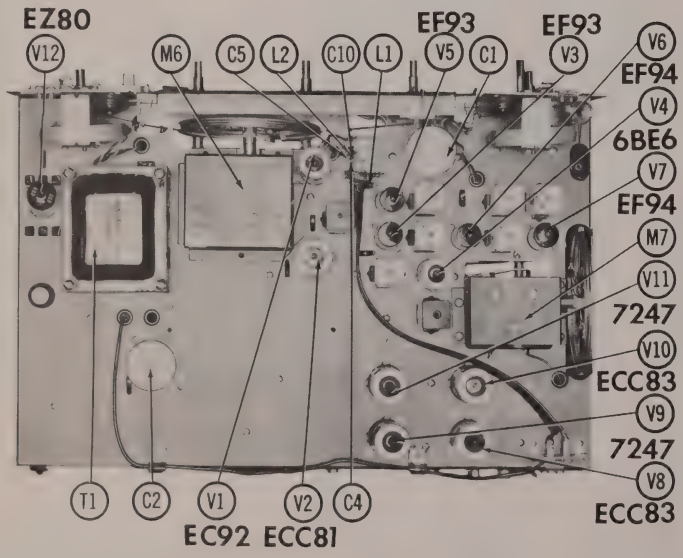
ALTERNATE CIRCUITS



CHASSIS BOTTOM VIEW-ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS TOP VIEW



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier	EC92/6AB4	V8	Channel 1 Preamplifier	ECC83/12AX7
V2	FM Converter-FM AFC	ECC81/12AT7	V9	Channel 1 AF Amp. - Cathode Follower	7247
V3	1st FM IF Amplifier	EF93/6BA6			
V4	AM Converter	6BE6	V10	Channel 2 Preamplifier	ECC83/12AX7
V5	1st AM IF Amplifier	EF93/6BA6	V11	Channel 2 AF Amp. - Cathode Follower	7247
V6	2nd FM-AM IF Amplifier	EF94/6AU6			
V7	FM Limiter	EF94/6AU6	V12	Rectifier	EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	250	79-010-023		C0270	FP376.5	TMQ-4616	TVL-3780	
B	■20	250			BR2025	TC55		TVA-1508	
C	20	250							
D	▲20	250							
C2A	20	250	79-010-023		C0270	FP376.5	TMQ-4616	TVL-3780	
B	▲20	250			BR2025	TC55		TVA-1508	
C	▲20	250							
D	■20	250							
C3	2000	15	79-001-037		BR20001	TC1501 †	TD-1000-15 †	TVAS-1170 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	4.7 5% NPO		NPO-DI 4.7	DTZ-4R7	C10V47U	CCTO-4R7	CNO-547	10TCC-V47
C6	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C7	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C8	4.7 5% N330					*		
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	12 10% NPO		NPO-DI 12	TCZ-12	C10Q12U	CCTO-120	CNO-412	10TCC-Q12
C11	100 10%		DI-100	DD-101	L10T1	CCTO-101	GP310	10TS-T10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C12	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C13	1.0 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C14	39 10% N220					*		10TCR-Q39
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C16	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C17	1000 10%		DI-1000	DD-102		CCD-102	GP210	10TS-D10
C18	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C19	4.7 10%		NPO-DI 4.7	DTZ-4R7	C10V47U	CCTO-4R7	CNO-547	10TCC-V47
C20								
C21	4.7 10% N330					*		
C22	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C23	2.4 5%							
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C25	1500 10%		DI-1500	DD-152		CCD-152	GP215	10TS-D15
C26	1.2 10%							10TCC-V12
C27	1000 10%		DI-1000	DD-102		CCD-102	GP210	10TS-D10
C28	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C29	1.8 10%							10TCC-V18
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C31	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C32	8.2 10%		NPO-DI 8.2	TCZ-8R2	C10V82U	CCTO-8R2		10TCC-V82
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C35	1200 10%		DI-1200	DD-122		CCD-122	GP210	10TS-D12
C36	22 10%		DI-22	DD-220	C10Q22	CCD-220	GP422	10TS-Q22
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C38	39 10% N220					*		10TCR-Q39
C39	1500 10%		DI-1500	DD-152		CCD-152	GP215	10TS-D15
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C41	15 10%		DI-15	DD-150	L10Q15	CCD-150	GP415	10TS-Q15
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C43	1500 10%		DI-1500	DD-152		CCD-152	GP215	10TS-D15
C44	4.7 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C45	27 10% NPO		NPO-DI 27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C46	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C47	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C48	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C49	1000 10%		DI-1000	DD-102		CCD-102	GP210	10TS-D10
C50	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C51	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C52	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C53	.15 400V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C54	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C55	.15 400V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C56	1500 1400V		HVD-15-1500	DD30-152	HVC16D15		2HV-215	30GA-D15
C57	1500 1400V		HVD-15-1500	DD30-152	HVC16D15		2HV-215	30GA-D15
C58	15 2000V		HVD-30-15	DD30-150	HVA20Q15	3CCD-150	2DY-415	30GA-Q15

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		77-001-474					Volume, Channel 2
B	500K							Volume, Channel 1
R2A	2meg		77-001-475					Bass, Channel 2
B	2meg							Bass, Channel 1
R3A	2meg		77-001-475					Treble, Channel 2
B	2meg							Treble, Channel 1

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	220Ω	
R6	10K	
R7	5600Ω	
R8	220K	
R9	220Ω	
R10	220Ω	
R11	470Ω	
R12	100K	
R13	1000Ω	
R14	1meg	
R15	22K	
R16	3900Ω 1W	
R17	470K	
R18	1000Ω	
R19	150Ω	
R20	120K	

ITEM No.	RATING	REMARKS
R21	1000Ω	
R22	18K	
R23	150Ω	
R24	3.3meg	
R25	100K	
R26	220K	
R27	120K	
R28	1meg	
R29	100K	
R30	39K	
R31	15K	
R32	100K	
R33	100K	
R34	1meg	
R35	68K	
R36	4700Ω	
R37	47K	

ITEM No.	RATING	REMARKS
R38	4.7meg	
R39	1meg	
R40	47K	
R41	4.7meg	
R42	1meg	
R43	1000Ω 7W	IRC#PW10-1000Ω
R44	510Ω 7W	IRC#PW10-510Ω
R45	68K	
R46	1500Ω	
R47	1500Ω	
R48	1000Ω	
R49	10K 7W	IRC#PW10-10000Ω
R50	5100Ω 7W	IRC#PW10-5100Ω
R51	2Ω 15W	
R52	150Ω	
R53	270Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BOGEN PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100mmf, 100mmf, 47K	78-907-001	Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1
K2	Tone Compensation	10000mmf, 10000mmf, 1000Ω, 1200Ω, 1500Ω, 3300Ω, 100K, 150K, 150K, 3.3meg	78-914-001	
K3	Tone Compensation	1500mmf, 1500mmf, 3300mmf, 3300mmf, 68K, 68K, 120K, 120K, 120K, 120K, 1.5meg, 1.5meg	78-916-001	
K4	Tone Compensation	270mmf, 1000mmf, 1200mmf, 4700mmf, 33K, 68K, 330K, 1.5meg	78-910-001	
K5	Tone Compensation	10000mmf, 10000mmf, 1000Ω, 1200Ω, 1500Ω, 3300Ω, 100K, 150K, 150K, 3.3meg	78-913-001	
K6	Tone Compensation	270mmf, 1000mmf, 1200mmf, 4700mmf, 33K, 68K, 330K, 1.5meg	78-910-001	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BOGEN PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	FM Ant. Trans.	95-5017-01				① Wound On 47Ω Resistor
L2	RF Choke (1uh)	95-5016-01	BC-561	4602	RTC-8515	② IRC Part #CLA
L3	RF Choke	95-5001-01 ①				③ Alternate Part #H454
L4	RF Choke (1.5uh)	95-5005-02	BC-562	4604	RTC-8516	④ Alternate Part #H297
L5	FM RF	95-5003-01				
L6	RF Choke (1.5uh)	95-5005-02	BC-562	4604	RTC-8516	
L7	FM Osc.					
L8	RF Choke (1uh)	95-5019-01 ②	BC-561	4602	RTC-8515	

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA BOGEN PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L9	Fil. Choke (1.9uh)	U512	BC-563	4606	RTC-8517	
L10	1st FM IF Trans.	H458	FM-254	1463	RTC-8599	
L11	2nd FM IF Trans.	H355	FM-254	1463	RTC-8599	
L12	Loopstick	H694	BC-419	705-A		
L13	AM Osc.	95-5009-01 ③	BC-392	A-12-C	RTC-8760	
L14	1st AM IF Trans.	95-5013-01 ④	BC-352	12-C1	RTC-8632	
L15	2nd AM IF Trans	95-5013-01 ④	BC-353	12-C2	RTC-8633	
L16	3rd FM IF Trans	H355	FM-254	1463	RTC-8599	
L17	3rd AM IF	95-5013-01 ④	BC-353	12-C2	RTC-8633	
L18	Discriminator	H295	FM-253	1464	RTC-8665	
L19	Line Choke(1.9uh)	U512	BC-563	4606	RTC-8517	
L20	Line Choke(1.9uh)	U512	BC-563	4606	RTC-8517	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA BOGEN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ .5A	400VCT @ .070A DC	6.3VCT @ .6A	83-618-000					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 3A	20VCT @ .280A DC							

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BOGEN PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.280A	RR-C6S1E16 *			3N26-1C1-RV		* Dual Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BOGEN PART No. FUSE	BOGEN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	1½A 125V S/B			3130I.5 (3AG 1½A 125V) S/B	342001	MLD 1½	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA BOGEN PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N542	1N542	1N295	1N295	FM Det. (Pigtail)
M4	1N542	1N542	1N295	1N295	FM Det. (Pigtail)
M5	1N541	1N541	1N60	1N60	AM Det. (Pigtail)

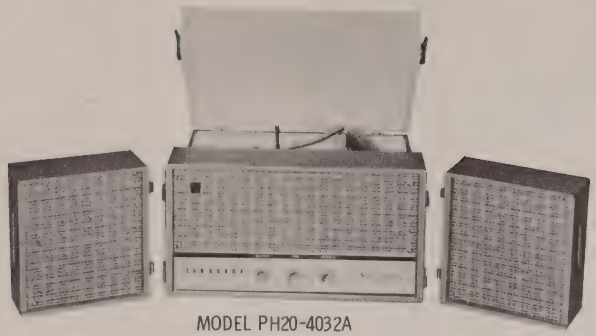
MISCELLANEOUS

ITEM No.	PART NAME	BOGEN PART No.	NOTES
M6	Tuning Cap.		FM, 2 Gang
M7	Tuning Cap.		AM, 2 Gang (Ant. 36—579mmf, Osc. 21—172mmf)
M8A	Switch	81-001-514	Input Selector (Rotary Wafer Type)
B	Switch		Mode
M9	Switch	81-003-001	FM (DPTT, Slide Type)
M10	Switch	81-003-001	AM (DPTT, Slide Type)
M11	Switch	81-003-004	Power Off-On (SPDT, Slide Type)

PHOTOFACT® Folder

CORONADO
MODELS PH20-4032A, B

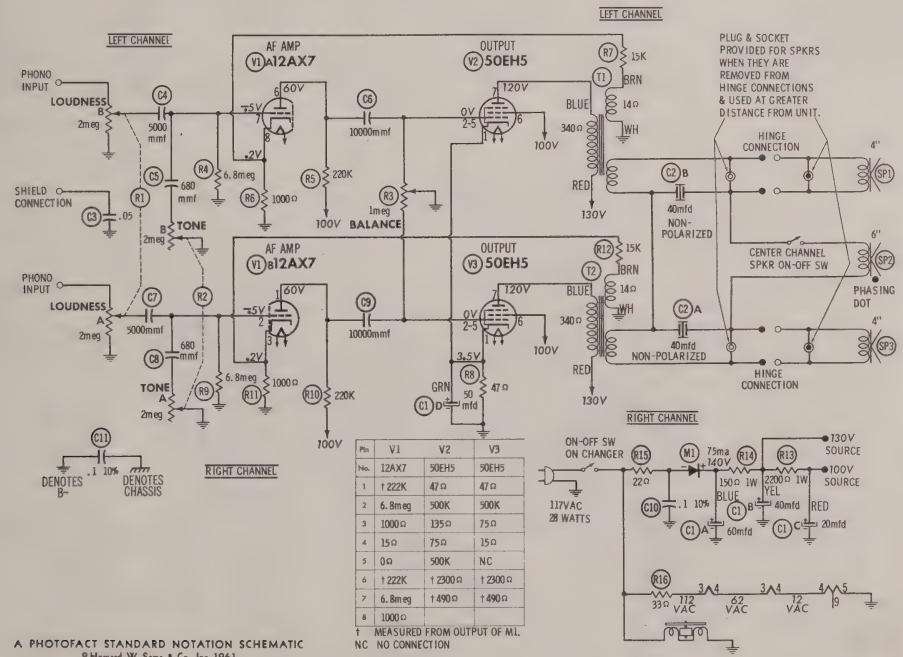
CORONADO
MODELS PH20-4032A, B



MODEL PH20-4032A

TRADE NAME	Coronado Models PH20-4032A, PH20-4032B
SUPPLIER	Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn.
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 28 Watts, .3 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE V-M 1201 – PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12



Pin No.	V1 12AX7	V2 50EH5	V3 50EH5
1	† 222K	47Ω	47Ω
2	6.8meg	500K	500K
3	1000Ω	135Ω	75Ω
4	15Ω	75Ω	15Ω
5	0Ω	500K	NC
6	† 222K	† 2300Ω	† 2300Ω
7	6.8meg	† 490Ω	† 490Ω
8	1000Ω		

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SET 516 FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50EH5 50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	60-6001	PR4-250	BBRQ0789.5	WQ410		TVA-4618	
B	40	150							
C	20	150							
D	50	15							
C2A	40	15NP	60-6002	PRS7330	BR4015			TVANS-1206.1*	
B	40	15NP		PRS7330	BR4015			TVANS-1206.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C4	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C5	680		DI-680	DD-681	L10T68	CCD-681	GP368	10TS-T68
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C8	680		DI-680	DD-681	L10T68	CCD-681	GP368	10TS-T68
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P10
C11	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P10

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		DT-189					Loudness, Right Channel
B	2meg							Loudness, Left Channel
R2A	2meg		DT-189					Tone, Right Channel
B	2meg							Tone, Left Channel
R3A	1meg		B-188	B-69				Balance
B	Bushing			AK-31				

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	6.8meg	
R5	220K	
R6	1000Ω	
R7	15K	
R8	47Ω	

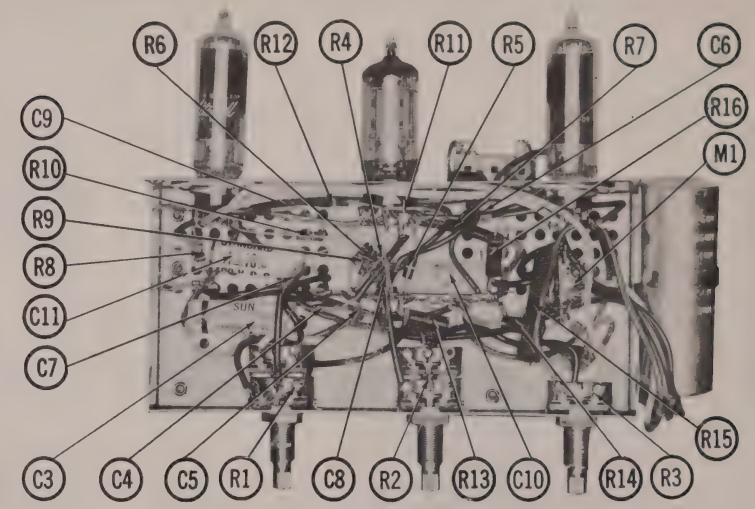
ITEM No.	RATING	REMARKS
R9	6.8meg	
R10	220K	
R11	1000Ω	
R12	15K	
R13	2200Ω 1W	

ITEM No.	RATING	REMARKS
R14	150Ω 1W	
R15	22Ω	
R16	33Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA CORONADO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5600Ω	6-8Ω	T-6001					
		SEC. 2						
		14Ω						
T2	PRI.	SEC. 1						
	5600Ω	6-8Ω	T-6001					
		SEC. 2						
		14Ω						

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	U-V4AZ16	4A05	
SP2	6"	PM	6-8Ω	O-6CM-57	6A21Z8	
SP3	4"	PM	3-4Ω	U-V4AZ16	4A05	

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA CORONADO PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.075A	2E4 *	1N1763 *	2F4 *	SR200 *	* Silicon Type

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA CORONADO PART No. CARTRIDGE	CORONADO PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	P-105	ST-075* & ST-250*	80-TS	Not Req.	26S	Not Req.	12TH-S	Not Req.	Model PH20-4032A
	P-105	43-3746* or 43-3753 * and 43-3708 *	86-TS-TB	Not Req.	96T	Not Req.	12TH-S	Not Req.	Model PH20-4032B

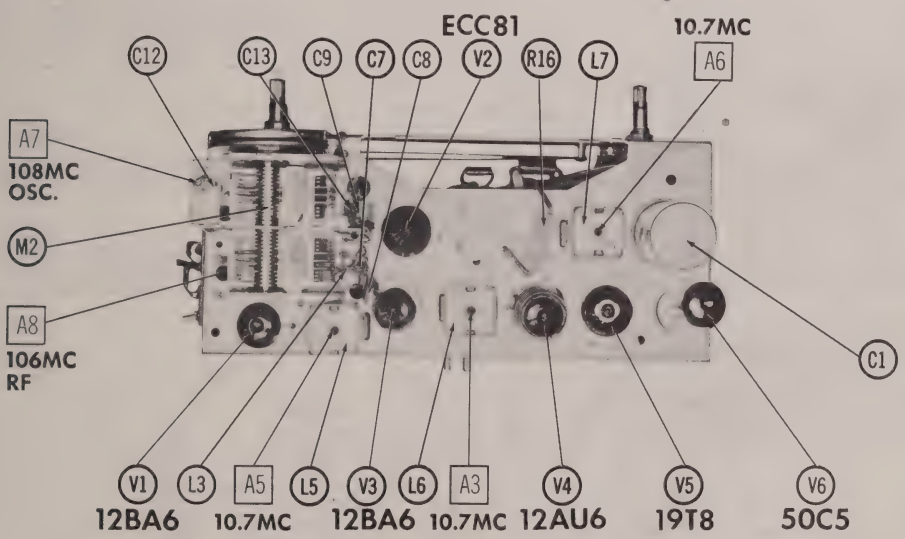
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

DEWALD
MODEL P-705

TRADE NAME	DeWald Model P-705
MANUFACTURER	DeWald, A Div. of United Scientific Laboratories Inc., 35-15 37th Ave., Long Island City 1, N. Y.
TYPE SET	AC-DC Operated 6 Tube FM Receiver
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 30 Watts, .35 Amp. @117 Volts AC
TUNING RANGE—FREQ. MOD.	88 — 108MC



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K1287

DEWALD
MODEL P-705

DEWALD
MODEL P-705

SET 516 FOLDER 10

FOLDER 10

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 thru A6.... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A7..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A8..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of Mixer. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Disconnect stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
2.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A6	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	108MC (Unmod.)	108MC	DC probe to point Ⓐ. Common to chassis.	A7	Adjust for maximum deflection.
4.	"	106MC	106MC Signal.	"	A8	Adjust for maximum deflection while rocking tuning gang.

FIG. 1

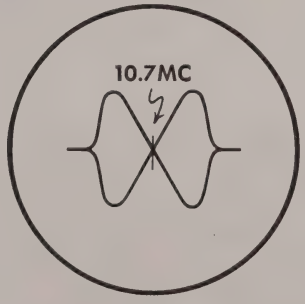
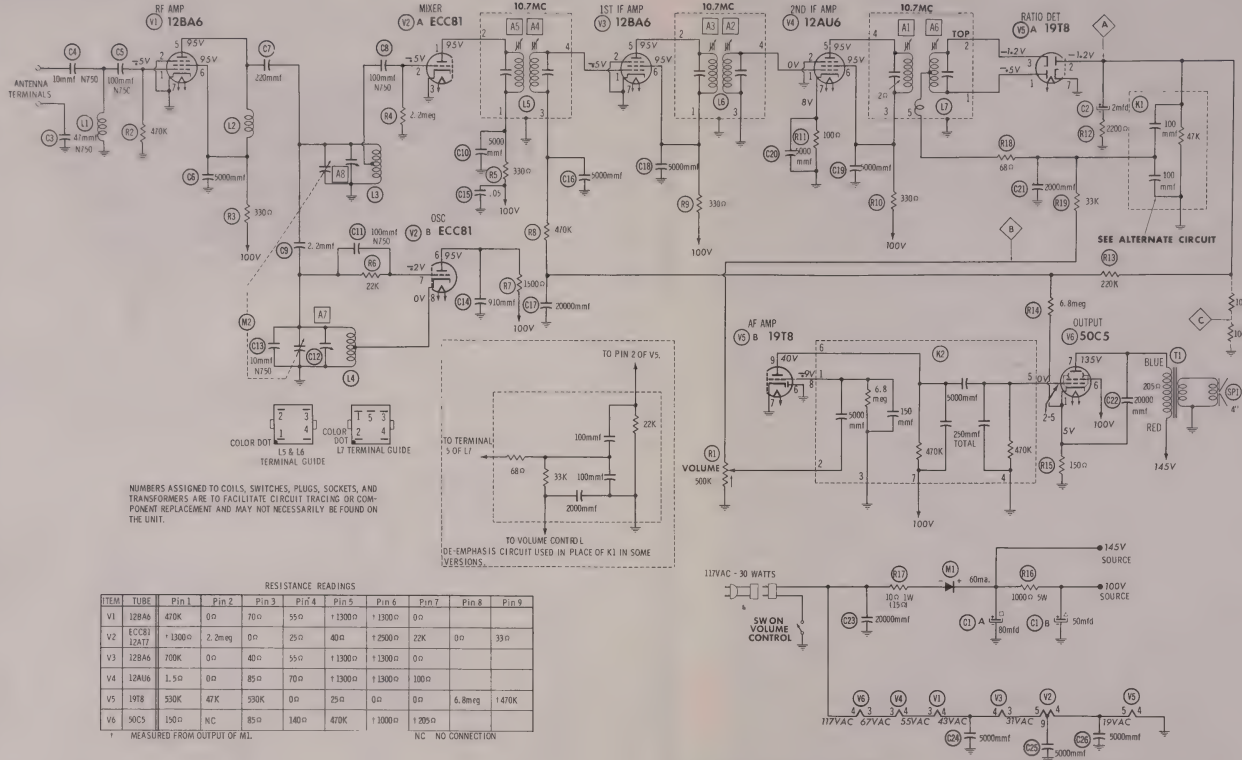


FIG. 2



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	470K	0Ω	70Ω	55Ω	†1300Ω	†1300Ω	0Ω		
V2	ECC81 12AT7	†1300Ω	2.2meg	0Ω	25Ω	40Ω	†2500Ω	22K	0Ω	33Ω
V3	12BA6	700K	0Ω	40Ω	55Ω	†1300Ω	†1300Ω	0Ω		
V4	12AU6	1.5Ω	0Ω	85Ω	70Ω	†1300Ω	†1300Ω	100Ω		
V5	19T8	530K	47K	530K	0Ω	25Ω	0Ω	0Ω	6.8meg	†470K
V6	50C5	150Ω	NC	85Ω	140Ω	470K	†1000Ω	†205Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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DEWALD MODEL P-705

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •		
V1	RF Amplifier	12BA6	V4	2nd IF Amplifier	12AU6
V2	Mixer-Osc.	ECC81/12AT7	V5	Ratio Det. -AF Amp.	19T8
V3	1st IF Amplifier	12BA6	V6	Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DeWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	200	2005-11			FP216.6	TMD-2200	TVL-2461	
B	▲50	200							
C2	2	25	2018-8	PRS1300	BBR2-50	TC302	TD-2-25	TVA-1201	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C4	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C5	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C7	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C8	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C9	2.2		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO2R2	CN0-522	10TCC-V22
C10	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C11	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12								
C13	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C14	910			DD-911	L10T91			
C15	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C17	20000		BPD-02	DD-203	BYA6S2	CCD-203	GP120	5HK-S20
C18	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C19	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C20	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C21	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C22	20000		BPD-02	DD-203	BYA6S2	CCD-203	GP120	5HK-S20
C23	20000		BPD-02	DD-203	BYA6S2	CCD-203	GP120	5HK-S20
C24	5000		BPD-005	DD-503	BYA10D5	CCD-502	GP250	5HK-D50
C25	5000		BPD-005	DD-503	BYA10D5	CCD-502	GP250	5HK-D50
C26	5000		BPD-005	DD-503	BYA10D5	CCD-502	GP250	5HK-D50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DeWALD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	V327-2	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	470K	
R3	330Ω	
R4	2.2meg	
R5	330Ω	
R6	22K	
R7	1500Ω	

ITEM No.	RATING	REMARKS
R8	470K	
R9	330Ω	
R10	330Ω	
R11	100Ω	
R12	2200Ω	
R13	220K	

ITEM No.	RATING	REMARKS
R14	6.8meg	
R15	150Ω	
R16	1000Ω 5W	IRC#PW5-1000Ω (15Ω) *
R17	10Ω 1W	
R18	68Ω	
R19	33K	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DeWALD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant. Coil	1104C-14		4584	RTC-8512	.24uh
L2	RF Choke	1104C-9	SW-631	4609	RTC-8519	5.6uh
L3	RF Coil					
L4	Osc. Coil					
L5	1st IF Trans.	1106B-3	FM-254	1463	RTC-8599	
L6	2nd IF Trans.	1106B-3	FM-254	1463	RTC-8599	
L7	Ratio Detector	1106B-2	FM-255	1465	RTC-8600	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	DeWALD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-4Ω	3823-24	A-3025	A-3332	24S53	S-12X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DeWALD PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	7003C-10	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DeWALD PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100mmf, 100mmf, 47K		Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1
K2	Audio Coup. Net .	150mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg		Aerovox PA-113-2 Centralab PC-151 Cornell-Dubilier 116TM2 Mallory MS-107 Sprague DT-2

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	DeWALD PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.060A	SR-846 *		1N1763 *	2F4 *	SR200 *	* Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	DeWALD PART No.	NOTES
M2	Tuning Cap.	V222C-4	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

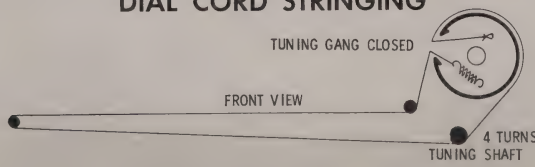
NAME	PART NO.	DESCRIPTION
Knob Cabinet	K-499 C-4001-1-2	Tuning, Volume

WIRING DATA

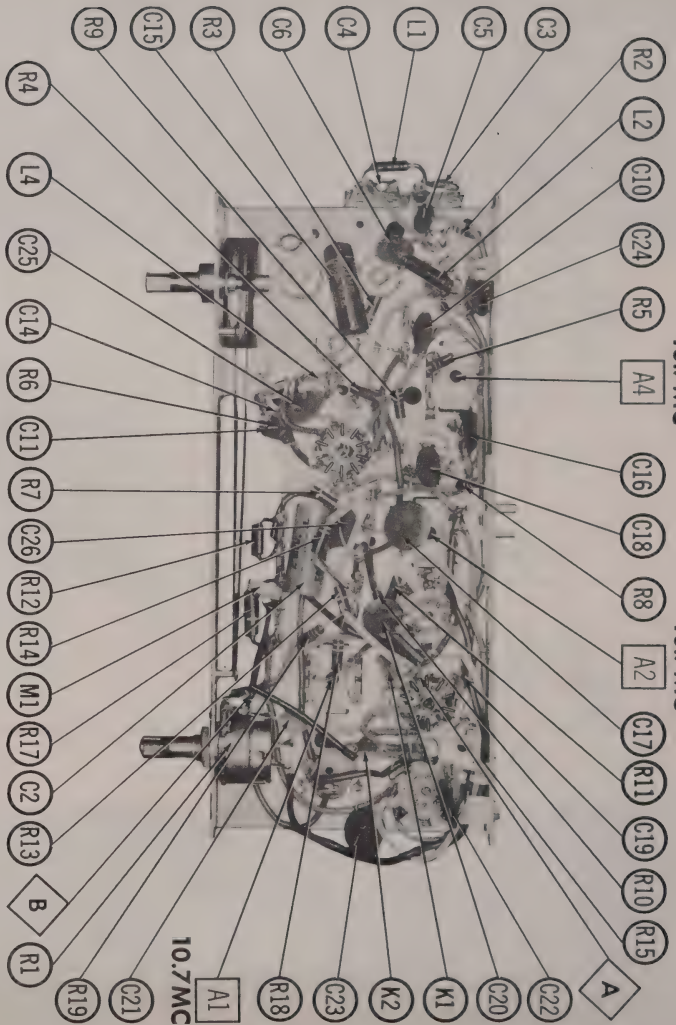
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING



CHASSIS—BOTTOM VIEW



PHOTOFACT® Folder

MOPAR
MODEL 700 (Revised)

MOPAR
MODEL 700 (Revised)

MOPAR
MODEL 700 (Revised)

TRADE NAME	Mopar Model 700 (Revised) For 1960 Dodge Trucks
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.
TYPE SET	Battery Operated 4 Tube, 1 Transistor Custom Built Truck AM Receiver.
POWER SUPPLY	12 Volt Storage Battery RATING 1.4 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	540 — 1605KC

ALIGNMENT INSTRUCTIONS

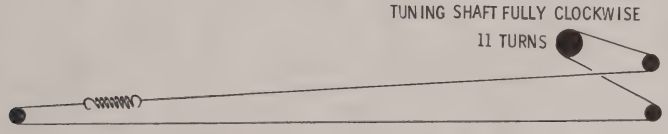
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4.... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 25mfd to antenna receptacle. Low side to chassis.	1605KC	"	"	A5, A6, A7	"
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1200KC and adjust A7 for maximum output.					

TUNING DRIVE CORD STRINGING



FRONT VIEW

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD215

SET 516 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •			• SYLVANIA •
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12DU7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	AR-12	Output				PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■500	16	61-0086-9	AFH2-02-75		WP200.7	TMD-2025	TVLS-2190*	
B	▲200	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 10%	#31-6502-8	DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C3								
C4	27		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	33		DI-33	DD-330	L10Q33	CCD-331	GP433	10TS-Q33
C7A		#31-6522-8						
B								
C8	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C11	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C12	4000		BPD-004	DD-402	BYA10D4	CCD-392	B-240	10TS-T40
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

\# Philco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	33-5580-20		A47F41meg	B13-137X	UT-438	Volume
	300K Tap							
B	Shaft				RS-3/16	SK 9	DS 37	
C	Switch				SWE-13	76-1	US 26	Power Off-On Bias
R2	15Ω	2(WW)	33-5591-2					

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

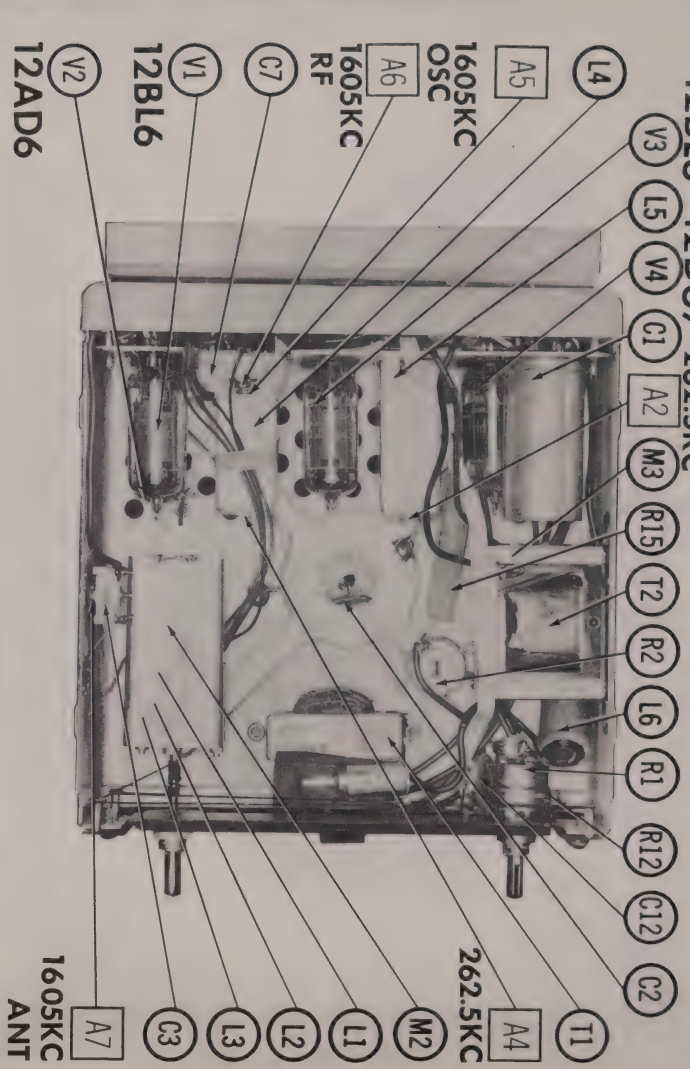
ITEM No.	RATING	REMARKS
R3	150K	
R4	1200Ω	
R5	4.7meg	
R6	1meg	
R7	22meg	
R8	4.7meg	

ITEM No.	RATING	REMARKS
R9	22meg	
R10	1meg	
R11	100K	
R12	150K	
R13	15meg	
R14	100Ω	

ITEM No.	RATING	REMARKS
R15	Temp. Comp. 10W	#33-1367-3
R16	0.27Ω	#66-8274360
R17	4700Ω	
R18	3.3Ω 2W	
R19	47K	

\# Philco Part Number.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant. Coil	①				
L2	RF Coil	①				
L3	Osc. Coil	①				
L4	Input IF Trans.	32-4676-6	BC-350	12-H1	RF-3	
L5	Output IF Trans.	32-4677-8 ②	BC-318 ▲			
L6	"A" Lead Hash Choke	32-4720-3				285uh

① Part of Tuner (M2).
② Alt. Part #32-4677-6.

▲ Solder Mounting Holes to Chassis.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.8	1	32-8875-2①					

① Alternate Part #32-8787-1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	40Ω	3-4Ω	32-8833			TR-60①		① Tape CT on Pri. Use 3-4Ω tap on secondary.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	36-1625-20	5A15	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	4A 32V	45-2656		307004	155004	SFE 4	HRF

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	Tuner	76-10315-1	
M3	Spark Plate	30-1254-1	300mmf

CABINETS & CABINET PARTS

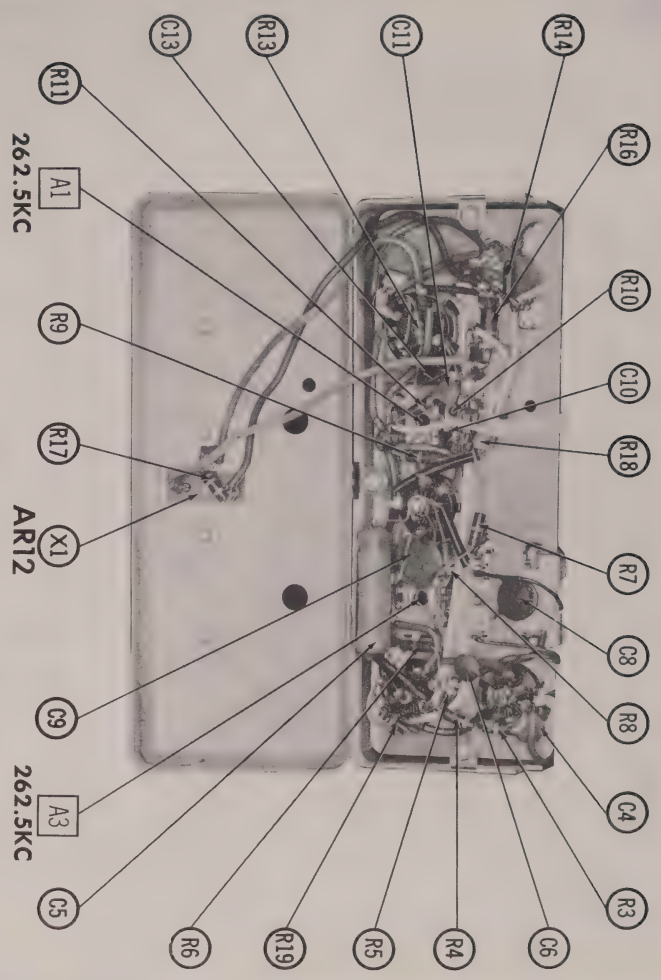
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

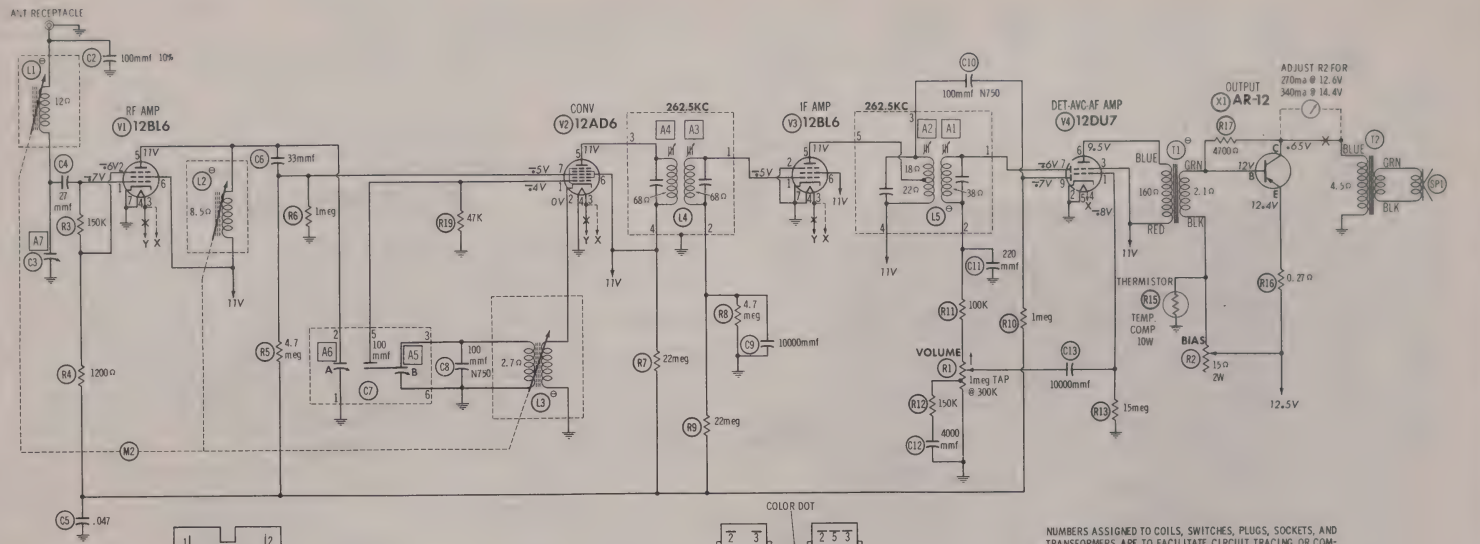
NAME	PART NO.	DESCRIPTION
Dial Scale	54-5329	
Dial Pointer	56-4362-11	
Knob	27-4687-23	Tuning, Volume

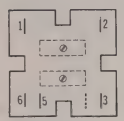
WIRING DATA

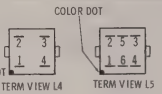
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No.	8885
Bonding Strap	Use BELDEN No.	8661

CHASSIS—BOTTOM VIEW







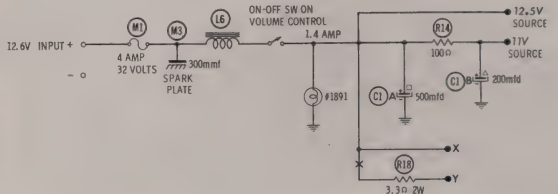


NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	4.6meg	4.5meg	5Ω	0Ω	110Ω	100Ω	0Ω		
V2	12AD6	47K	0Ω	5Ω	0Ω	170Ω	100Ω	1meg		
V3	12BL6	4.7meg	0Ω	5Ω	0Ω	120Ω	100Ω	0Ω		
V4	12DU7	15meg	0Ω	100Ω	4Ω	0Ω	260Ω	1.1meg	NC	6meg

NC NO CONNECTION
TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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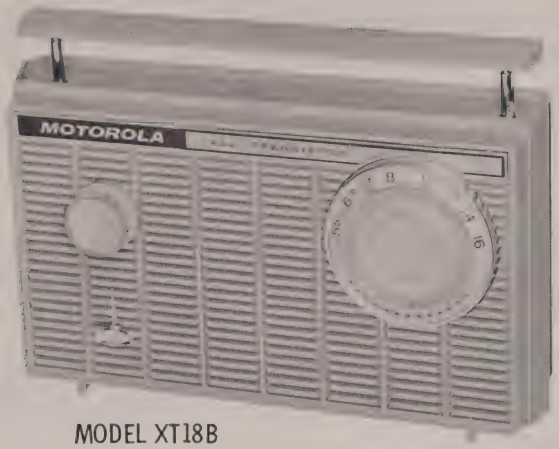
MOPAR
MODEL 700 (Revised)

PHOTOFACT® Folder with CIRCUITRACE®

MOTOROLA MODELS XT18B, XT18S (Ch. HS-802)

MOTOROLA MODELS XT18B, XT18S (Ch. HS-802)



MODEL XT18B

MOTOROLA MODELS XT18B, XT18S (Ch. HS-802)

TRADE NAME	Motorola Models XT18B, XT18S (Ch. HS-802)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	10MA @ 9 Volts DC (No Signal, Min. Volume)
	25MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 – 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3.... GENERAL CEMENT #5097, 8727
WALSCO #2515
A4..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547
A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	600KC	600KC	"	A4	"
3.	"	1620KC	Tuning gang fully open.	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2 thru 4.

DISASSEMBLY INSTRUCTIONS

CABINET BACK

1. Loosen back panel mounting screws. (Screws are captive). Remove panel.
2. Remove batteries and unsnap connectors.
3. Release handle by pressing button.
4. Remove 2 screws holding cabinet back.
5. Unfasten arms from handle rods by pushing them to the side with a screwdriver.
6. Remove cabinet back.

CHASSIS

1. Remove cabinet back.
2. Remove knobs.
3. Remove earphone jack mounting nuts.
4. Remove chassis mounting screws and palnut from front of cabinet.
5. Unsolder necessary leads and remove chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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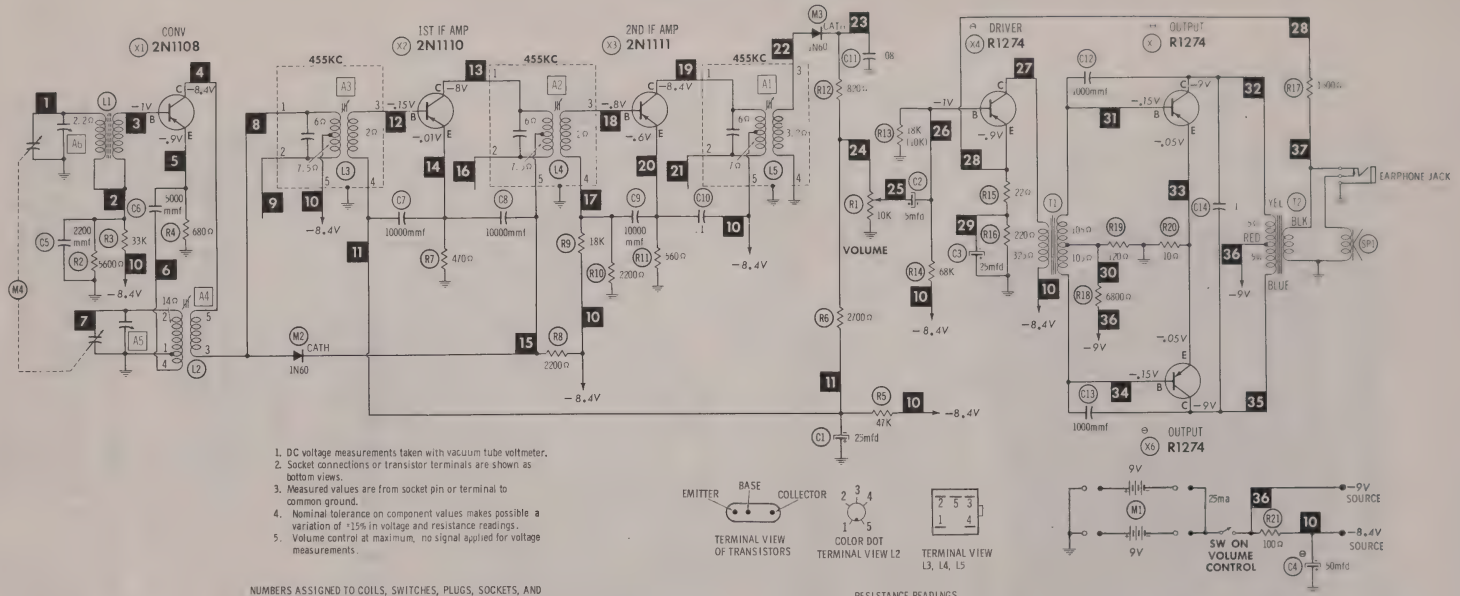
KF312

SET 516 FOLDER 12



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N1108	5600Ω	680Ω	†100Ω
X2	2N1110	5000Ω	470Ω	†2300Ω
X3	2N1111	2200Ω	560Ω	†100Ω
X4	R12/4	15K	240Ω	†425Ω
X5	R12/4	225Ω	10Ω	†5Ω
X6	R12/4	225Ω	10Ω	†5Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM CircuiTrace POINT 36.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MOTOROLA MODELS XT18B, XT18S (Ch. HS-802)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1108	Converter		2N1366	2N412	PNP
X2	2N1110	1st IF Amp.		2N483	2N409	PNP
X3	2N1111	2nd IF Amp.		2N483	2N409	PNP
X4	R1274 *	Driver	2N408			PNP
X5	R1274 *	Output	2N408			PNP
X6	R1274 *	Output	2N408			PNP

* Alternate Type 2N1274.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	25	10	23K646499	PTT-10025	NLW25-10	TT10X25	ML25-12	TE-1118	
C2	6	10	23K646500	XPP-10006	NLW6-25	TT10X6	ML6-12	TE-1127.1	
C3	25	10	23K646499	PTT-10025	NLW25-10	TT10X25	ML25-12	TE-1118	
C4	50	15	23K643463	BCD15050	ECPB415	PET1575	ML50-15	VL-1174	①

① Some versions may use 50mfd@10V in this application (Part #23K644671).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.1 50V		P288N-1	DDA-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10
C11	.08 50V	#8R131283			DPMS6S82			2WF-S82
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	.1 50V		P288N-1	DDA-104	CUB2P1	IDP-2-104	GEM-201	2TM-P10

\# Motorola Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	10K	½	18B646239					Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	5600Ω	
R3	33K	
R4	680Ω	
R5	47K	
R6	2700Ω	
R7	470Ω	
R8	2200Ω	

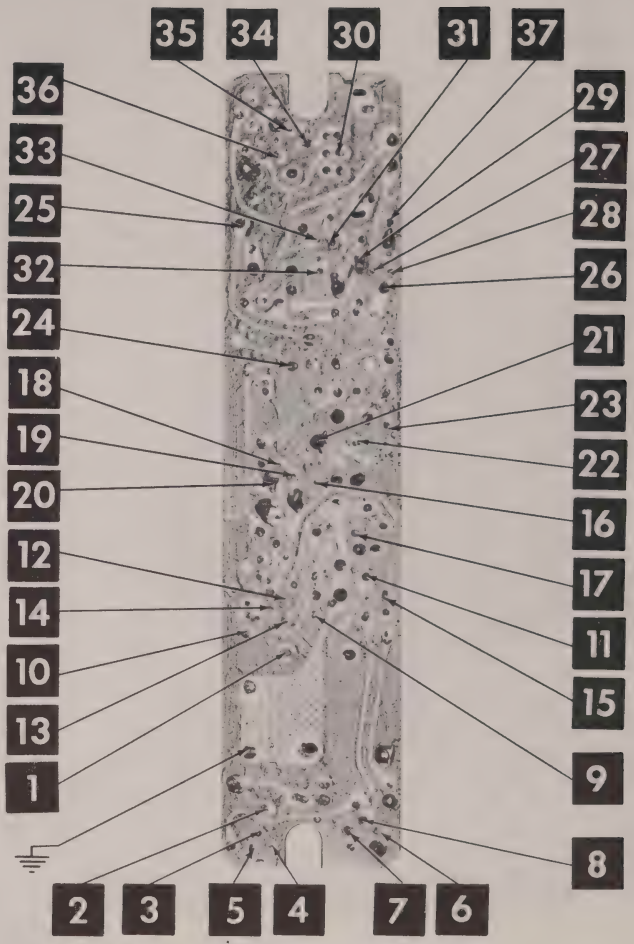
ITEM No.	RATING	REMARKS
R9	18K	
R10	2200Ω	
R11	560Ω	
R12	820Ω	
R13	18K	(10K) *
R14	68K	
R15	22Ω	

ITEM No.	RATING	REMARKS
R16	220Ω	
R17	1500Ω	
R18	6800Ω	
R19	120Ω	
R20	10Ω	
R21	100Ω	

* Alternate Value.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick	24B646232				
L2	Osc. Coil	24K646241				
L3	1st IF Trans.	24K646230				
L4	2nd IF Trans.	24K646230				
L5	3rd IF Trans.	24K646231				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.8	1	25B641394					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	100Ω CT	3-4Ω	(Part of SP1)					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	50C646223 *	4A07 ‡	* Includes T2 ‡ Trim Mounting Ear to Fit.

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			D6		276		M-1603	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	48K640754	1N60	1N60	AVC (Pigtail)
M3	1N60	48K640754	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

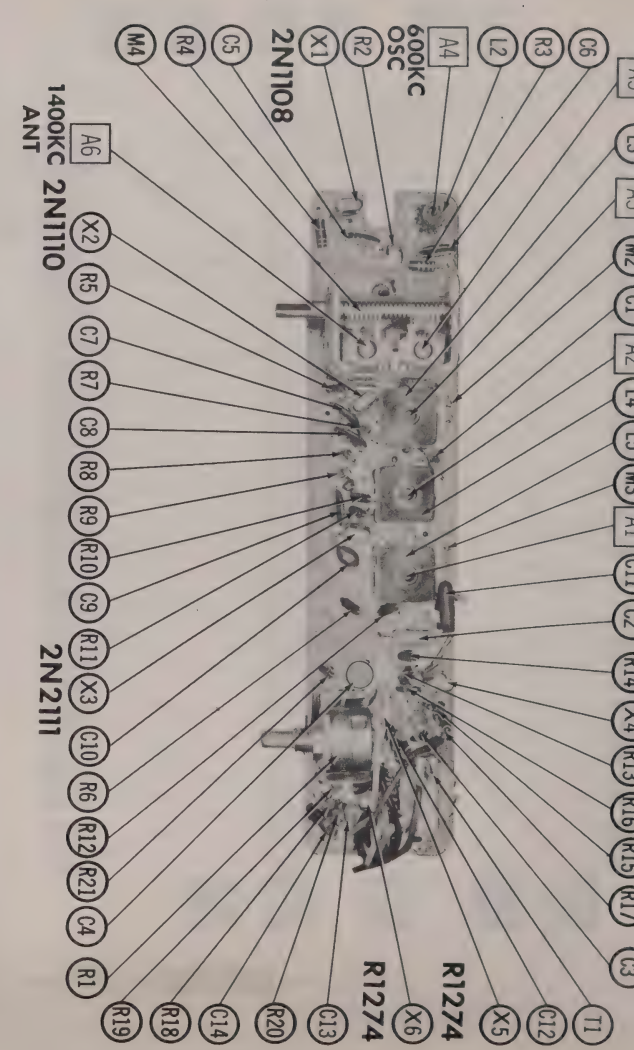
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap.	19B646275	2 Gang
	Printed Board	84C646375	Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C646406	Tuning, Clear
Knob	36B646355	Volume, Clear
Cabinet Back	1V60030A25	Blue, Model XT18B
Cabinet Back	1V60030A26	Tan, Model XT18S
Cabinet Front	1V60030A40	Blue, Model XT18B
Cabinet Front	1V60030A41	Tan, Model XT18S
Handle	1C646363	Blue, Model XT18B
Handle	1K646364	Tan, Model XT18S

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

**OLYMPIC
MODEL 731**

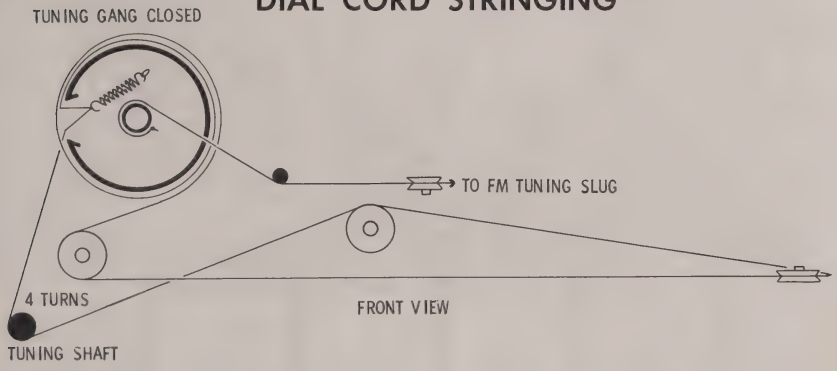
OLYMPIC
MODEL 731

OLYMPIC
MODEL 731

TRADE NAME	Olympic Model 731		
MANUFACTURER	Olympic, A Div. of the Siegler Corp., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated 6 Tube FM-AM Receiver With Stereo Amplifier And 4 Speed Automatic Record Changer		
POWER SUPPLY	105 – 120 Volts AC, 60 Cycles	RATING	68 Watts, .6 Amp. @117 Volts AC
TUNING RANGE – BROADCAST	535 – 1700KC	FREQ. MOD.	88 – 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER RX26202 – SEE SIMILAR MONARCH UA12 – PHOTOFACT SET 465 FOLDER 6

DIAL CORD STRINGING

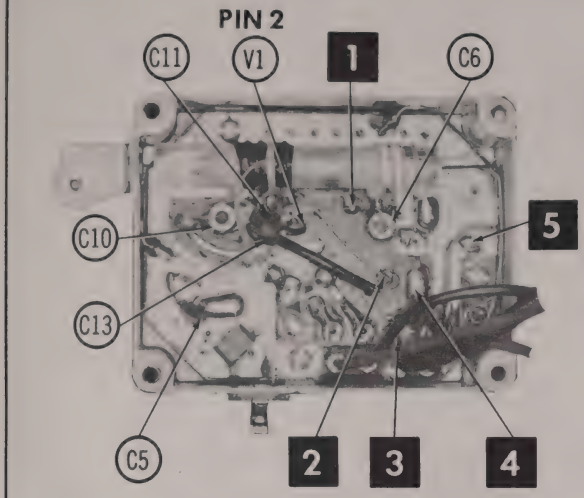


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

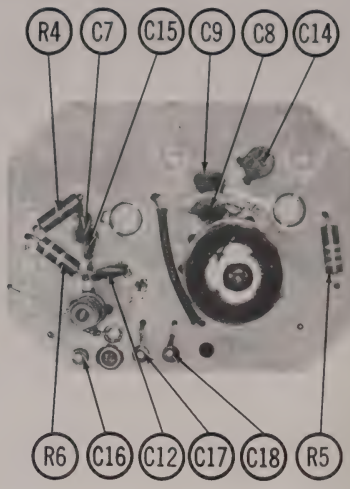
KN270

SET 516 FOLDER 13

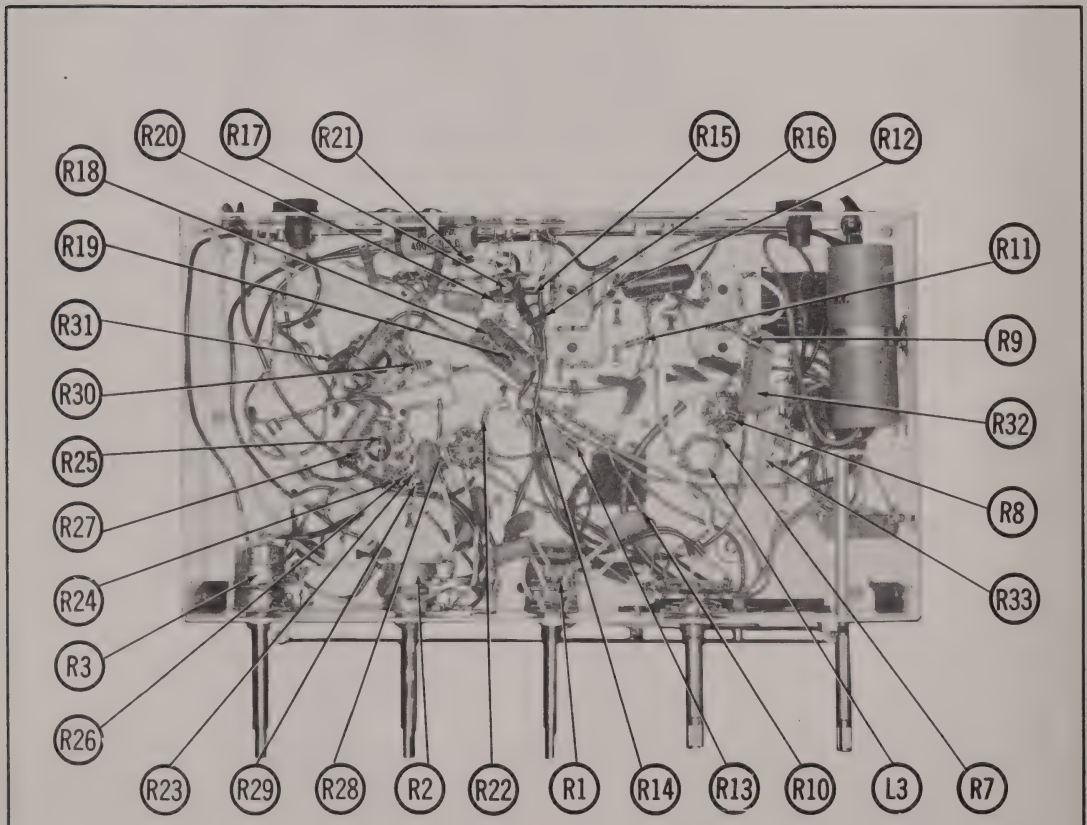


A Howard W. Sams CIRCUITRACE® Photo

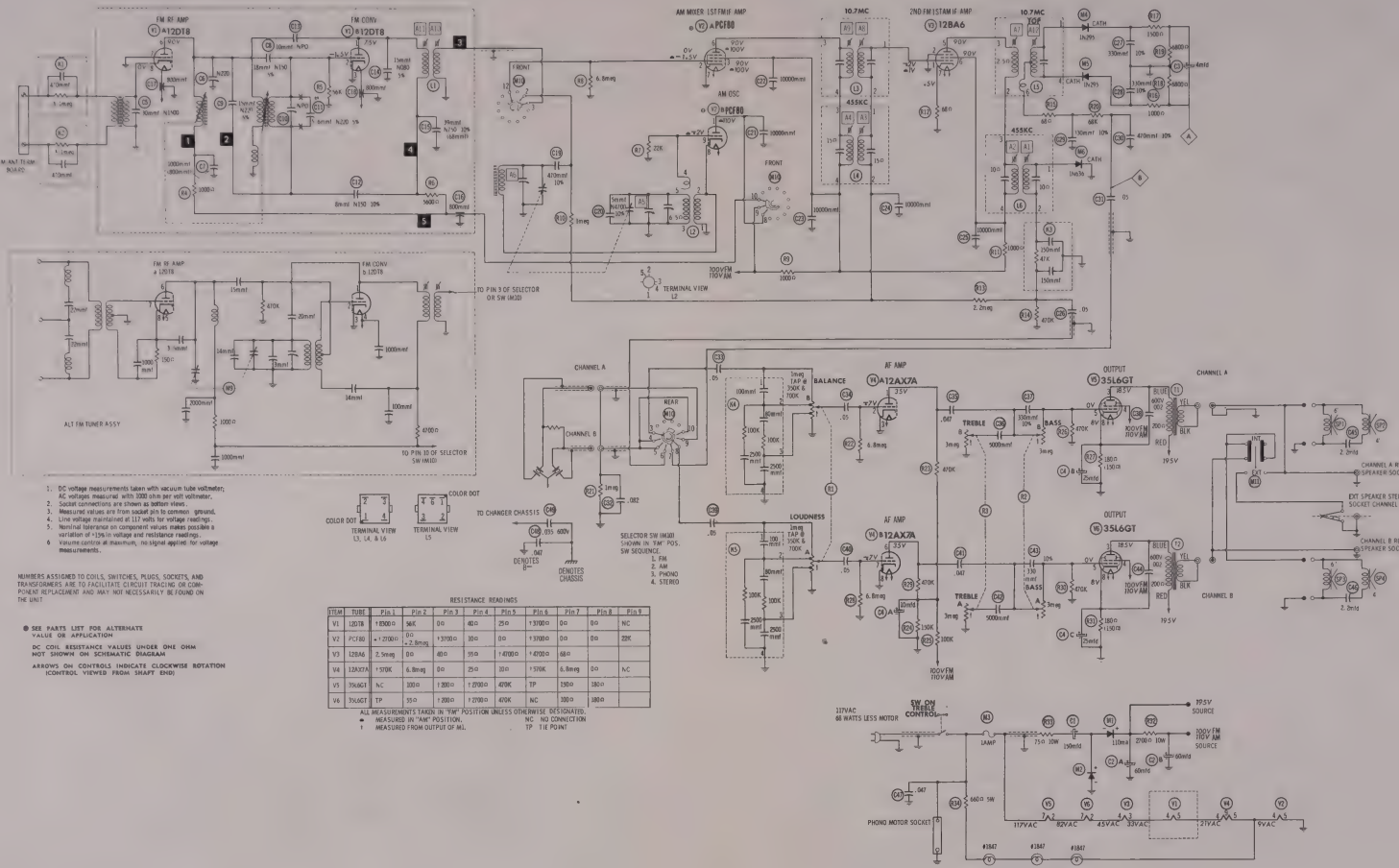
FM RF SUBCHASSIS-BOTTOM VIEW



FM RF SUBCHASSIS
TOP VIEW



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†1500Ω	56K	0Ω	40Ω	25Ω	†370Ω	0Ω	0Ω	NC
V2	PCF80	•†2700Ω	0Ω or 2.8meg	†370Ω	10Ω	0Ω	†370Ω	0Ω	0Ω	22K
V3	12BA6	2.5meg	0Ω	45Ω	35Ω	†470Ω	†470Ω	68Ω		
V4	12AX7A	†570K	6.8meg	0Ω	25Ω	20Ω	†570K	6.8meg	2Ω	NC
V5	35L6GT	NC	100Ω	†200Ω	†2700Ω	470K	TP	250Ω	180Ω	
V6	35L6GT	TP	35Ω	†200Ω	†2700Ω	470K	NC	250Ω	180Ω	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
• MEASURED IN "AM" POSITION. NC NO CONNECTION
† MEASURED FROM OUTPUT OF M1. TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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OLYMPIC
MODEL 731

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
- A1 Thru A4, A8, A9... GENERAL CEMENT #5097, 8727 WALSCO #2515
- A5, A6..... GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
- A7, A12..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
- A10, A11..... GENERAL CEMENT #8282, 8606, 8606-L, 9091 WALSCO #2526, 2541, 2542, 2543, 2544

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Place 3 turn loop of stiff insulated wire around Loopstick. Connect Signal generator leads across loop.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1500KC	1500KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Place a piece of insulated wire between the FM Mixer-Oscillator tube and shield. Connect high side of signal generator to this wire. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	Place a piece of insulated wire between the FM Mixer-Oscillator tube and the shield. Connect high side of generator to this wire. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10, A11	Disconnect stabilizing Capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
5.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A12	Adjust to place marker at the center of crossover lines similar to Fig. 2 SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

For Models using variable Inductance tuner only.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 150Ω in each lead.	100MC (Unmod.)	(FM) 100MC	DC probe to point Ⓐ. Common to chassis.	Slack Adjusting Lever.	Adjust until signal is received at 100MC on dial.

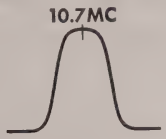


FIG. 1

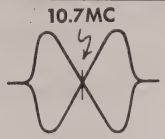
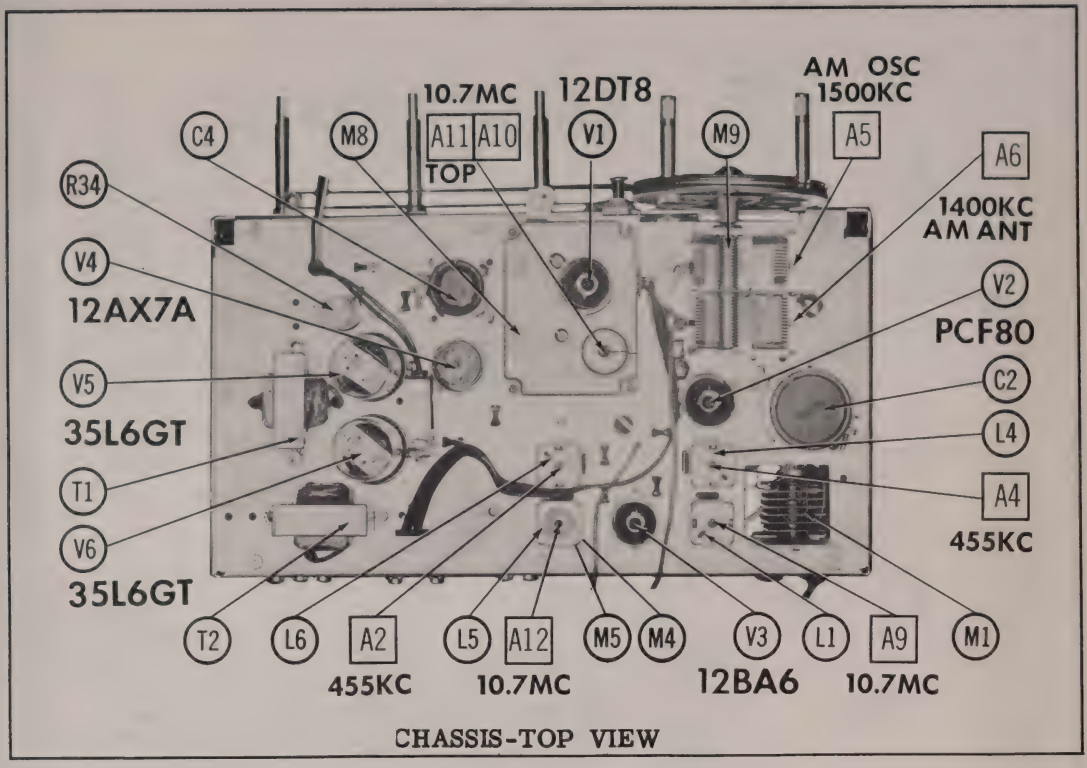
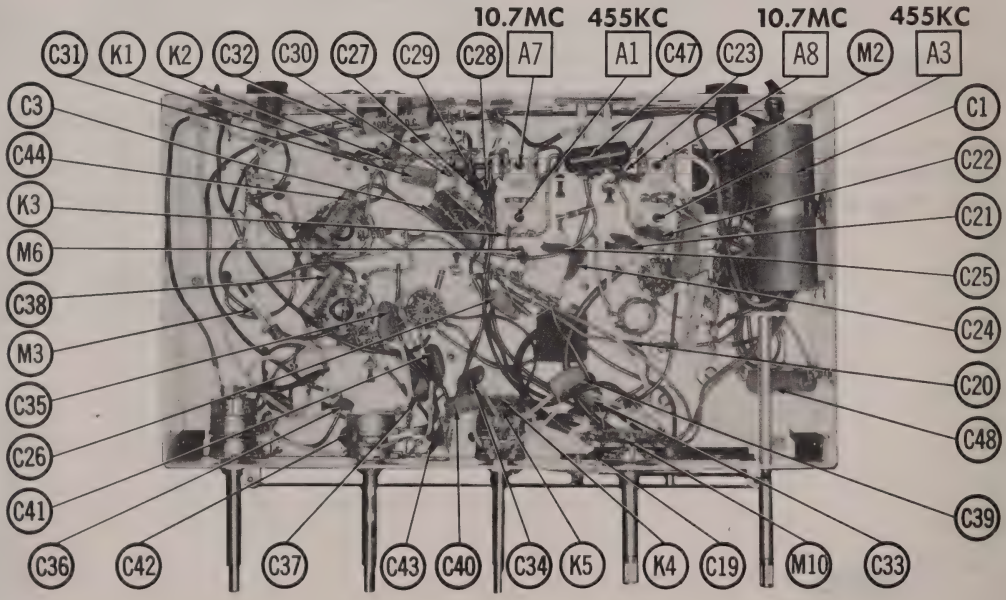


FIG. 2



CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW-ALIGNMENT, CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	12DT8	V4	Channel A AF Amp. - Channel B AF Amp.	12AX7A
V2	1st FM IF Amp. - AM Mixer-AM Osc.	PCF80 (8A8) *	V5	Channel A Output	35L6GT
V3	2nd FM-1st AM IF Amp.	12BA6	V6	Channel B Output	35L6GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	150	C03622-1	PRS1520	BR15015	TC495	TD-150-150	TVA-1422	①
C2A	60	350	C025794	PR4-450		WT458		TVAS-3626*	②
B	60	350							
C	60	200							
C3	4	50	C02756	PRS1400	BBR4-50	TT50X4	TD-4-50	TVA-1402	
C4A	10	150	C026980	PRS3550	BBRT4315C	TCT3112	TDLT-1	TVA-3415	
B	25	25							
C	25	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 40mfd@150V in this application (Part #C03152).
② C2C is not used.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	30 N1500							
C6								
C7	1000	(800) †	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	18 N150 5%					*		10TCP-Q18
C9	15 N220 5%					*		10TCR-Q22
C10								
C11	5.6 N220 5%	Note 1						
C12	8 N150 10%							
C13	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C14	15 N080 5%					*		
C15	39 N750 10%	(68) †		TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C16	800		EF-001	MFT-1000		CCF-102	CT280A	
C17	800		EF-001	MFT-1000		CCF-102	CT280A	
C18	800		EF-001	MFT-1000		CCF-102	CT280A	
C19	470 10%		DI-470	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C20	5 N4700 10%	#CCRZ050K				*		
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C27	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C28	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C29	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C30	470 10%		DI-470	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C31	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C32	.082 400V				DPMS6S82	6DP-4-823		6PS-S82
C33	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C34	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C35	.047 50V		P288N-047	DD-503	CUB2S47	IDP-2-473	GEM-4147	2TM-S47
C36	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C37	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C38	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C39	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C40	.05 50V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C41	.047 50V		P288N-047	DD-503	CUB2S47	IDP-2-473	GEM-4147	2TM-S47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C42	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C43	330 10%		DI-331	DD-331	L10T33	CCD-331	GP333	10TS-T33
C44	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C45	2.2mfd 3V			UK-225				
C46	2.2mfd 3V			UK-225				
C47	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-6147	4TM-S47
C48	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-6147	4TM-S47
C49	.035 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6PS-S35

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate Value.
Note 1. Not used in some versions.
Olympic Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg *		PT25963					Loudness, Channel B
B	1meg *							Balance, Channel A
R2A	3meg		PT26447	F1-79		† QJ-1279R	■ UE4156	Bass, Channel B
B	3meg			R2-79				Bass, Channel A
R3A	3meg		PT26446	F1-79				Treble, Channel B
B	3meg			R2-79		‡ QJ-1502R	▲ UE4157-S	Treble, Channel A
C	Switch			KR-2				Power Off-On

† "CONCENTRIKIT" equivalent: K-6 Kit with base elements & shafts: B13-140, P13-128 (Panel)
(Not Available as a factory assembled unit). B13-140, R1-209 (Rear)
‡ "CONCENTRIKIT" equivalent: K-6 Kit with base elements and shafts: B13-140, P13-128 (Panel)
(Not Available as a factory assembled unit). B13-140, R1-209 (Rear)
76-2 (Switch)

■ "STA-LOC" equivalent: FC36A, RU36A, OS1895A, IS2375.
▲ "STA-LOC" equivalent: FA36A, RU36A, OS1875A, IS2375, US42
* Taps@350K & 700K.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1000Ω	
R5	56K	
R6	5600Ω	
R7	22K	
R8	6.8meg	
R9	1000Ω	
R10	1meg	
R11	1000Ω	
R12	68Ω	
R13	2.2meg	
R14	470K	

ITEM No.	RATING	REMARKS
R15	68Ω	
R16	1000Ω	
R17	1500Ω	
R18	6800Ω	
R19	6800Ω	
R20	68K	
R21	1meg	
R22	6.8meg	
R23	470K	
R24	150K	
R25	100K	

ITEM No.	RATING	REMARKS
R26	470K	
R27	180Ω	(150Ω) *
R28	6.8meg	
R29	470K	
R30	470K	
R31	180Ω	(150Ω) *
R32	2700Ω 10W	IRC#PW10-2700Ω
R33	75Ω 10W	IRC#PW10-75Ω
R34	660Ω 5W	IRC#PW5-660Ω

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA OLYMPIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	2nd FM IF Trans.	TR26714	FM-254	1463	RTC-8599	
L2	Loopstick	LP26983	BC-419	705-A		
L3	AM Osc. Coil	CL2709	BC-393	69-OSC	RTC-8646	
L4	1st AM IF Trans.	TR1644	BC-352	12-C1	RTC-8632	
L5	Ratio Detector	TR26982	FM-255 *	1465 *	RTC-8600 *	* Connect Crystals Externally.
L6	2nd AM IF Trans.	TR1645	BC-353	12-C2	RTC-8633	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	OLYMPIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	TR27104	A-3025	A-3332	24S53	S-12X	
T2	2400Ω	3-4Ω	TR27104	A-3025	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	SK26564	6A1	
SP2	4"	PM	3-4Ω	SK4342	4A07R	
SP3	6"	PM	3-4Ω	SK26564	6A1	
SP4	4"	PM	3-4Ω	SK4342	4A07R	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	470mmf, .3-1meg	PC27016	Centralab RC-471 Sprague AC1-1
K2	Antenna Filter	470mmf, .3-1meg	PC27016	Centralab RC-471 Sprague AC1-1
K3	AM Diode Filter	150mmf, 150mmf, 47K	PC2478-1	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 111TM2 Sprague D-2
K4	Loudness Comp.	80mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420	Aerovox PA-683 Centralab PC-325 Sprague TC-5
K5	Loudness Comp.	80mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420	Aerovox PA-683 Centralab PC-325 Sprague TC-5

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	OLYMPIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.110A	RF3160 *	1N1763 ♦	100A *	SR200 ♦	* Selenium Type
M2	.110A	RF3160 *	1N1763 ♦	100A *	SR200 ♦	♦ Silicon Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	1A 250V P/T	FU26367		318001 (3AG 1A 250V P/T)		GJV 1	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1N295	1N295		1N295	1N295	FM Det. (Pigtail) Part of L5
M5	1N295	1N295		1N295	1N295	FM Det. (Pigtail) Part of L5.
M6	1N636	1N636		1N295	1N636	AM Det. (Pigtail)

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	OLYMPIC PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M7			76TS-TB	N8-7 * and N8-3 *	26S	S1-1* and S3-3	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M8	Tuner	CL26978	FM, Complete
M9	Tuning Cap.	CV26977	AM, 2 Gang (Ant. 24-540mmf, Osc. 21-187mmf)
M10	Switch	SW26972	Band Selector, Rotary Wafer Type
M11	Switch		Speaker (DPDT, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

REALISTIC
MODEL 90L696

REALISTIC
MODEL 90L696

REALISTIC
MODEL 90L696

TRADE NAME	Realistic Model 90L696
SUPPLIER	Radio Shack Corp., 730 Commonwealth Ave., Boston 17, Mass.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 7MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE	BROADCAST 540-1600KC 12MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A6 .... GENERAL CEMENT # 5000, 5003, 5066, 8271, 8272, 8276, 8277, 8290, 8609, 8722, 9150, 9298
WALSCO #2515, 2516, 2518, 2519, 2525, 2541

A4, A5 ..... GENERAL CEMENT # 5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	1400KC	1400KC Signal	"	A5	"
4.	"	600KC	600KC	"	A6	Adjust for maximum output. Repeat steps 2, 3 and 4.

SET 516 FOLDER 14

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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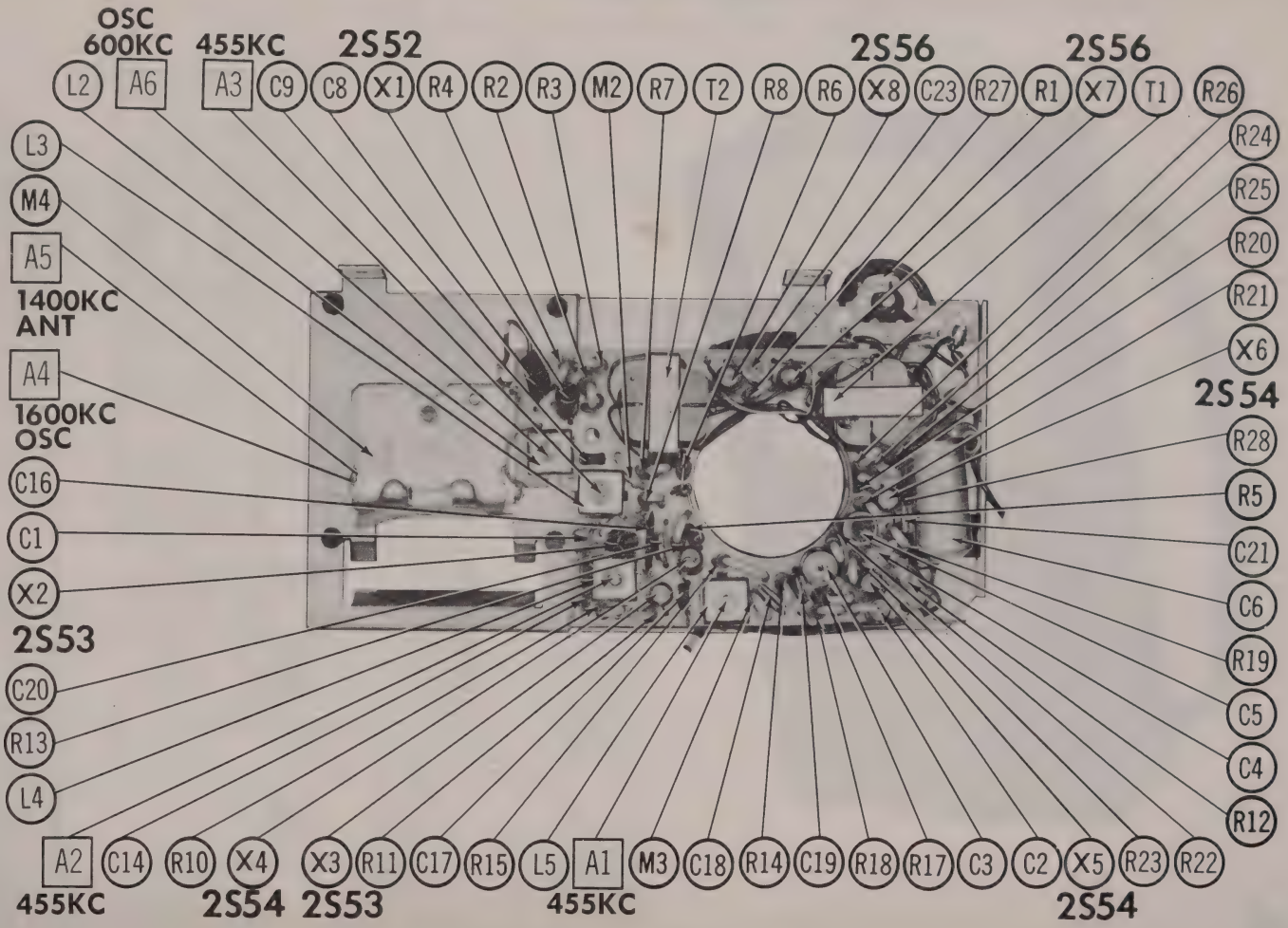
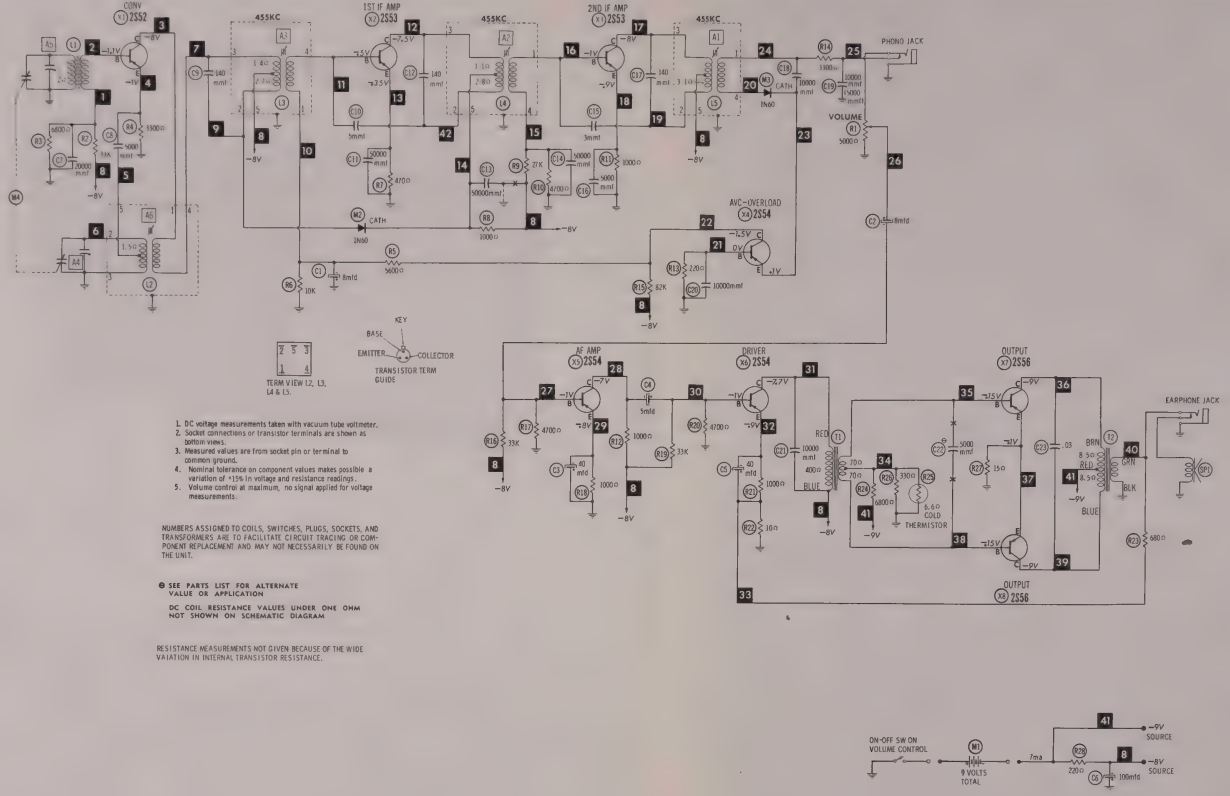


CHASSIS TOP VIEW



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™
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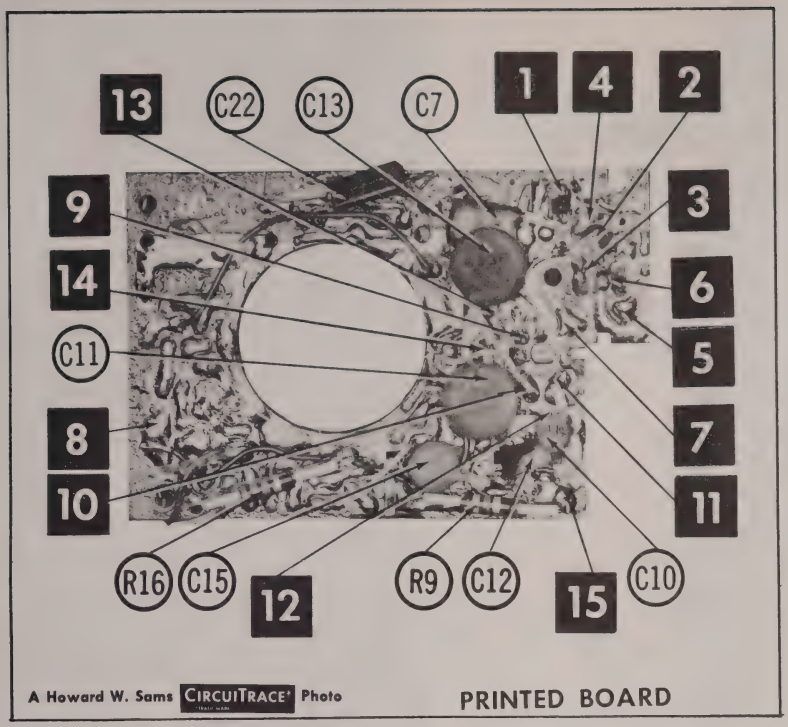
REALISTIC MODEL 90L696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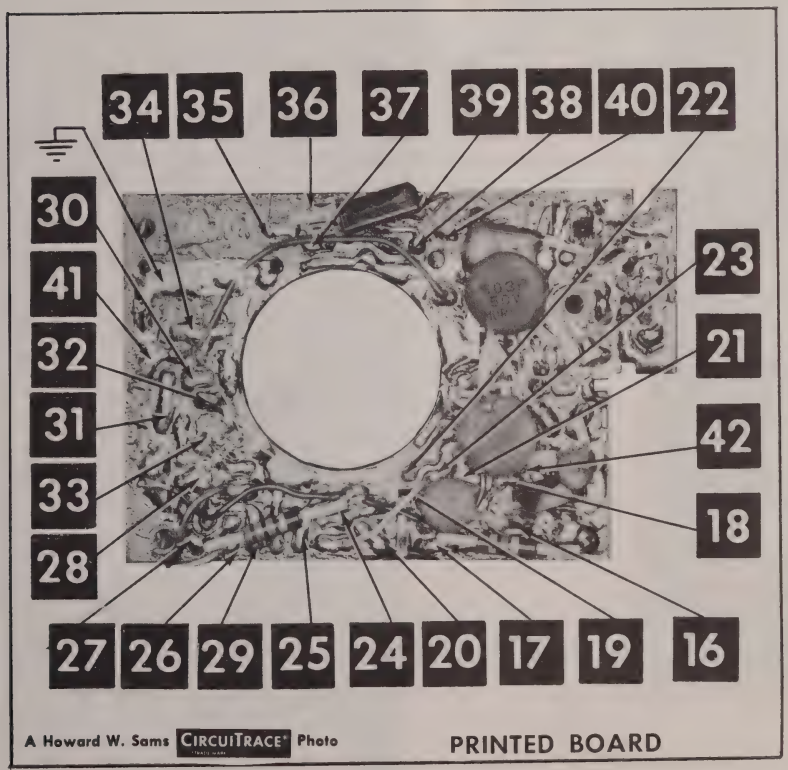
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A Howard W. Sams CIRCUITRACE Photo
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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52	Converter	2N412	2N486	2N412	PNP
X2	2S53	1st IF Amplifier	2N410	2N483	2N410	PNP
X3	2S53	2nd IF Amplifier	2N410	2N483	2N410	PNP
X4	2S54	AVC-Overload	2N408	2N362	2N408	PNP
X5	2S54	AF Amplifier	2N408	2N362	2N408	PNP
X6	2S54	Driver	2N408	2N362	2N408	PNP
X7	2S56	Output	2N408	2N632	2N408	PNP
X8	2S56	Output	2N408	2N632	2N408	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	REALISTIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	8	3		PTT-3008	NLW8-6	TT6X8	ML8-6	TE-1052.5	
C2	8	3		PTT-3008	NLW8-6	TT6X8	ML8-6	TE-1052.5	
C3	40	3		PTT-3040	NLW40-3	TT3X40	ML40-6	TE-1057	
C4	5	6		PTT-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C5	40	3		PTT-3040	NLW40-3	TT3X40	ML40-6	TE-1057	
C6	100	10		PTT-10100	NLW100-10	TT15X100	ML100-15	TE-1119.3	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C8	5000		C80V502AM	DDM-502	H-05D5		TA-250	TG-D50	
C9	140			DD-151	L10T15	CCD-151	GP315	10TS-T15	
C10	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C11	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50	
C12	140			DD-151	L10T15	CCD-151	GP315	10TS-T15	
C13	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50	
C14	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50	
C15	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33	
C16	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50	
C17	140			DD-151	L10T15	CCD-151	GP315	10TS-T15	
C18	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C19	10000	(5000) †	C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C20	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C21	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C22	5000	Note 1	C80V502AM	DDM-502	H-05D5		TA-250	TG-D50	
C23	.03 250V								

† Alternate Value.

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REALISTIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4						Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	6800Ω	
R4	3300Ω	
R5	5600Ω	
R6	10K	
R7	470Ω	
R8	1000Ω	
R9	27K	
R10	4700Ω	

ITEM No.	RATING	REMARKS
R11	1000Ω	
R12	1000Ω	
R13	220Ω	
R14	3300Ω	
R15	82K	
R16	33K	
R17	4700Ω	
R18	1000Ω	
R19	33K	

ITEM No.	RATING	REMARKS
R20	4700Ω	
R21	1000Ω	
R22	10Ω	
R23	680Ω	
R24	6800Ω	
R25	6.6Ω Cold	
R26	330Ω	
R27	15Ω	
R28	220Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		REALISTIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick					
L2	Osc. Coil					
L3	1st IF Trans.					
L4	2nd IF Trans.					
L5	3rd IF Trans.					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	REALISTIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	REALISTIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	450Ω CT	8-10Ω				TR-22①		① Bend ears down.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REALISTIC PART No.	QUAM PART No.	
SP1	2 3/4"	PM	8-10Ω	SP-3004B	27A06Z10	

BATTERIES

ITEM No.	VOLTAGE	REALISTIC PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			P6		226		M-1600	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		REALISTIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	AVC (Pigtail)
M3	1N60		1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	REALISTIC PART No.	NOTES
M4	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE MODELS 1263, 1264, 1274, 1275, 1276 (Ch. 528.59780, 528.59800)

SILVERTONE MODELS 1263, 1264, 1274, 1275, 1276 (Ch. 528.59780, 528.59800)

MODEL 1274

SILVERTONE MODELS 1263, 1264, 1274, 1275, 1276 (Ch. 528.59780, 528.59800)

TRADE NAME	Silvertone Models 1263 (Ch. 528.59780); 1264, 1274, 1275, 1276 (Ch. 528.59800)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 30 Watts, .32 Amp. @117 Volts AC

MODEL 1263 USES RECORD CHANGER 528.57310 OR 528.57311.
MODELS 1264, 1274, 1275 and 1276 USE RECORD CHANGER 528.56740 OR 528.56741.
FOR SERVICE INFORMATION — SEE SIMILAR SILVERTONE 528.56100 SERIES — PHOTOFACT SET 417
FOLDER 10 OR RECORD CHANGER MANUAL RC-12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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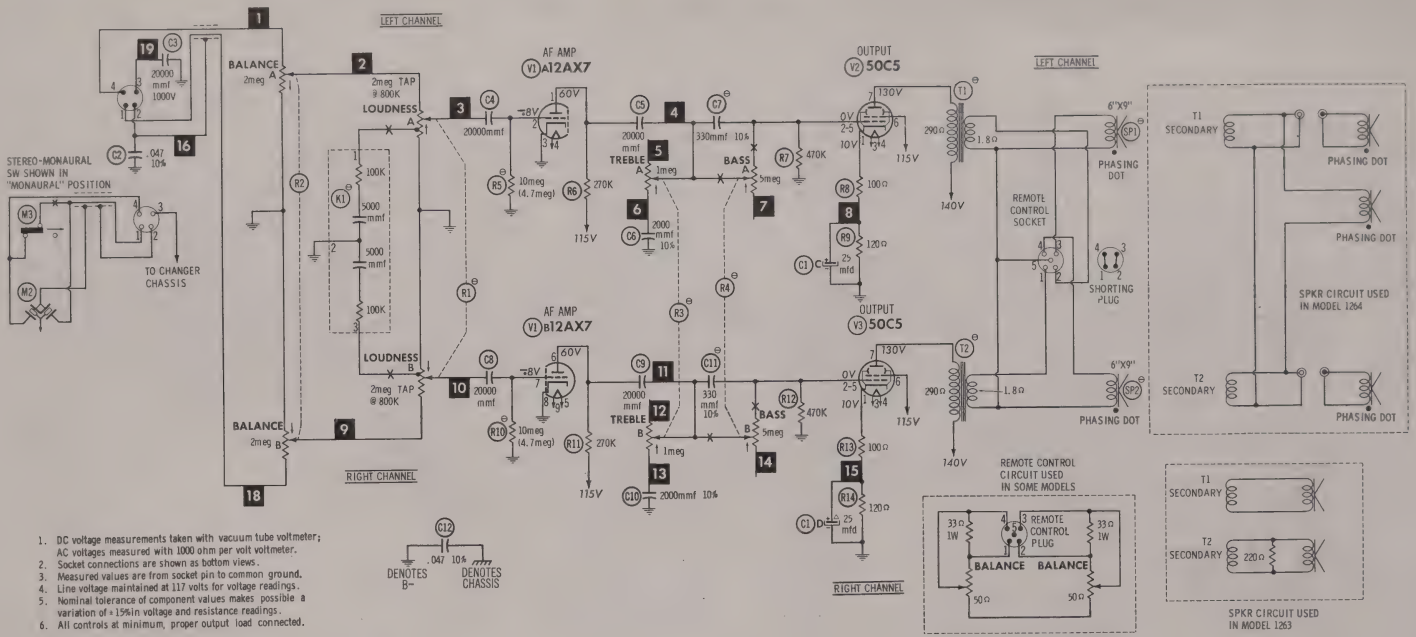
SET 516 FOLDER 15

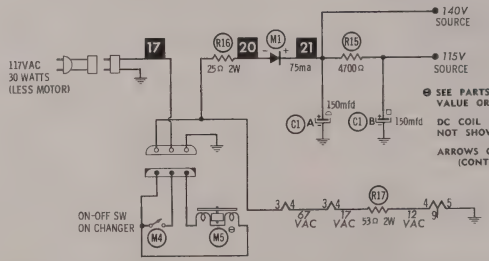


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†275K	10meg	0Ω	25Ω	0Ω	†275K	10meg	0Ω	NC
V2	50C5	220Ω	470K	240Ω	160Ω	NC	†4700Ω	†290Ω		
V3	50C5	220Ω	470K	160Ω	78Ω	NC	†4700Ω	†290Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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SILVERTONE MODELS 1263, 1264, 1274, 1275, 1276 (Ch. 528.59780, 528.59800)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel Output	50C5
V3	Right Channel Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲150	150	18-111-5						
B	■150	150							
C	25	25							
D	▲25	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V 10%		V84C4S47		PM4S47	4DP-3-473		4TM-S47
C3	20000 1000V		BPD-02	DD-203			B-120	10TS-S20
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C6	2000 10%		DI-2000			CCD-202	GP220	10TS-D20
C7	330 10%	Note 1	DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	10TS-S20
C10	2000 10%		DI-2000			CCD-202	GP220	10TS-D20
C11	330 10%	Note 1	DI-330	DD-331	L10T33	CCD-331	GP330	10TS-T33
C12	.047 400V 10%		V84C4S47		PM4S47	4DP-3-473		4TM-S47

Note 1. Not used in Chassis 528.59780.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	24-401①	BT-82			FB26T75	Loudness, Left Channel
	800K Tap							
B	2meg	½		STR-82			RU26T75	Loudness, Right Channel
	800K Tap							
C	Shaft			Not Req.			CS3500	
R2A	2meg	½	24-408				FA26A	Balance, Left Channel
B	2meg	½					RU26R	Balance, Right Channel
C	Shaft						CS3500	
R3A	1meg	½	24-405②	B-70	AD47-1meg-Z		FA16A	Treble, Left Channel
B	1meg	½		SR-70	Not Req.		RU16A	Treble, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R4A	5meg	½	24-403③				FD56R	Bass, Left Channel
B	5meg	½					RU56R	Bass, Right Channel
C	Shaft						CS3500	

① Chassis 528.59780 uses Part #24-400 (No taps).
② Chassis 528.59780 uses 1meg dual treble (Part #24-406)
③ Not used in Chassis 528.59780.

PRINTED BOARD

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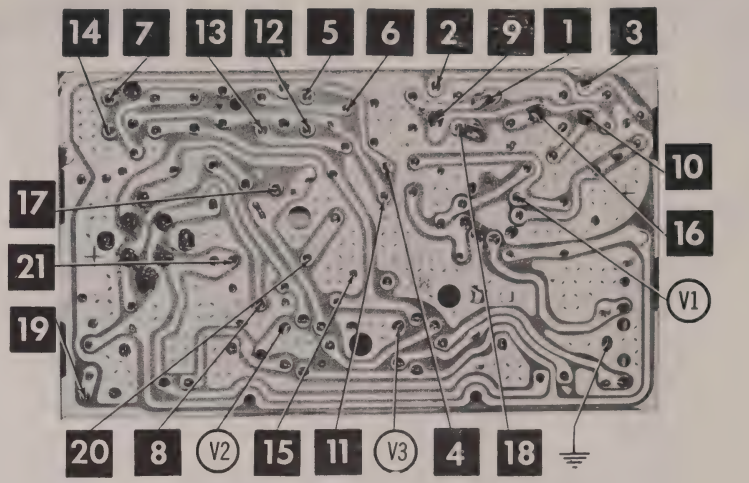
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	10meg	(4.7meg) *
R6	270K	
R7	470K	
R8	100Ω	
R9	120Ω	

ITEM No.	RATING	REMARKS
R10	10meg	(4.7meg) *
R11	270K	
R12	470K	
R13	100Ω	
R14	120Ω	

ITEM No.	RATING	REMARKS
R15	4700Ω	
R16	25Ω 2W	Pt. #43-30-0 †
R17	53Ω 2W	

* Used in Chassis 528.59780.
† Some Chassis 528.59800 may use Part #43-4-1.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Tone Compensation	5000mmf, 5000mmf, 100K, 100K	13-41-3 ①	

① Not used in Chassis 528.59780.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	6-8Ω	80-133-1 ①					
T2	2500Ω	6-8Ω	80-133-1 ①					

① Alternate Part #80-134-1 Used in Chassis 528.59780.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	6"x 9"	PM	6-8Ω	33-459-4A *	69A3Z8	* Models 1274, 1275, 1276, Alternate Part #33-459-4.
SP2	6"x 9"	PM	6-8Ω	33-459-4A *	69A3Z8	‡ Model 1264
	6"	PM		33-462-4 ‡		♦ Model 1263
	5 1/4"	PM		33-481-4 ‡		
	5 1/4"	PM		33-453-4 ♦		

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	SILVERTONE PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.075A		1N1763 *	K200 *	SR200 *	* Silicon Type

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	SILVERTONE PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	33-326-0	Not Req.	13TB	Not Req.	26S	S1-1 * & S3-3 *	10T2-S	Not Req.	

MISCELLANEOUS

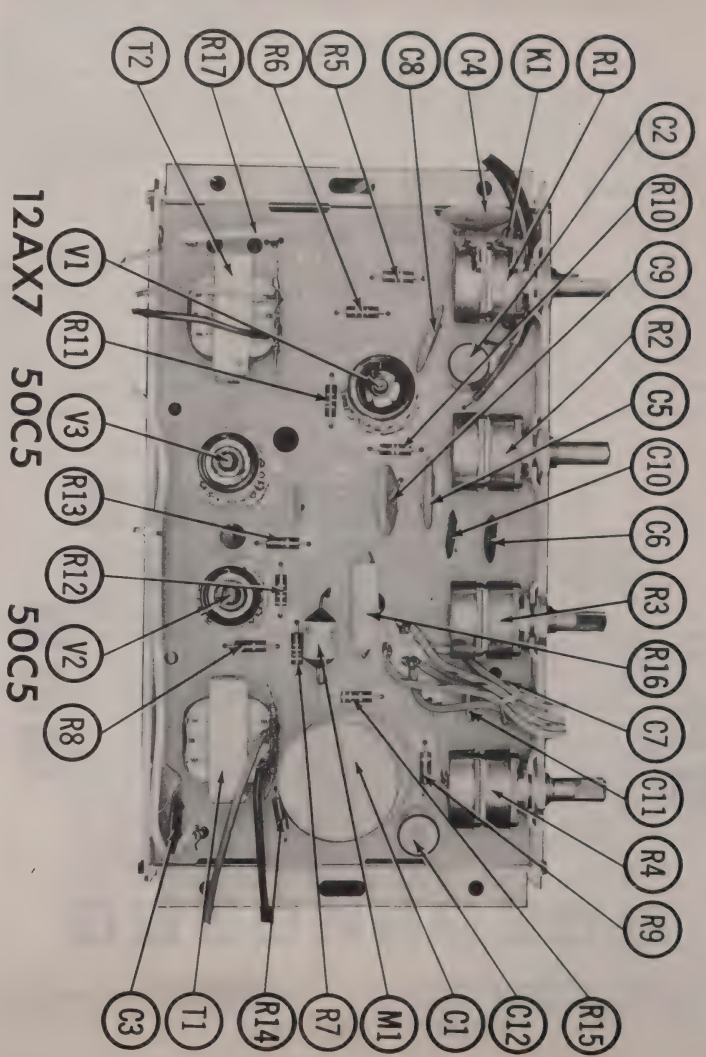
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Switch		Stereo-Monaural (SPST, Slide Type, Part of Changer)
M4	Switch	84-7838	Off-On-Reject (Part of Changer)
M5	Motor	59-162	Phono Drive (Part of Changer Ch. 528.57310, 528.56740)
	Motor	59-158	Phono Drive (Part of Changer Ch. 528.57311, 528.56741)
	Printed Board	84-11366-0	Complete, Less Tubes, Chassis 528.59800
	Printed Board	84-11365-0	Complete, Less Tubes, Chassis 528.59780
	Printed Board	25-27-1	Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1389-0	4 Used, Models 1274, 1275, 1276
Knob	52-1383-0	Loudness, Model 1263
Knob	52-1382-0	Balance, Model 1263
Knob	52-1384-0	Tone, Model 1263
Knob	52-1391-0	4 Used, Model 1264
Cabinet	42-87-4	Right Speaker, Model 1264
Cabinet	42-88-4	Left Speaker, Model 1264
Cabinet	42-131-2	Complete, Model 1264
Cabinet	42-120-2	Complete, Model 1263
Cabinet	42-127-2	Mahogany, Model 1274
Cabinet	42-128-2	Limed Oak, Model 1275
Cabinet	42-129-2	Fruitwood, Model 1276
Cabinet	21-725-0	Mahogany, Speaker, Left, Model 1274
Cabinet	21-724-0	Mahogany, Speaker, Right , Model 1274
Cabinet	21-768-0	Limed Oak, Speaker, Right, Model 1275
Cabinet	21-769-0	Limed Oak, Speaker, Left, Model 1275
Cabinet	21-727-0	Fruitwood, Speaker, Left, Model 1276
Cabinet	21-726-0	Fruitwood, Speaker, Right, Model 1276
Leg	49-649	Mahogany, Model 1274
Leg	49-650	Limed Oak, Model 1275
Leg	49-651	Fruitwood, Model 1276
Lid	21-758-0	Top, Mahogany, Model 1274
Lid	21-759-0	Top, Limed Oak, Model 1275
Lid	21-760-0	Top, Fruitwood, Model 1276
Handle	49-694	Carrying, Model 1263
Handle	49-638	Carrying, Model 1264

CHASSIS—TOP VIEW



PHOTOFACT® Folder

**STEELMAN
MODEL 406**

STEELMAN
MODEL 406

STEELMAN
MODEL 406

TRADE NAME	Steelman Model 406
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 31 Watts, .33 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #300068 — SEE V-M 1201 — PHOTOFACT SET 436
FOLDER 18 OR RECORD CHANGER MANUAL RC-12

SET 516 FOLDER 16

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KT119

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	Channel A AF Amp. - Channel B AF Amp.	12AU7A
V2	Channel A AF Amp. - Channel B AF Amp.	12AX7 (12AU7) *
V3	Channel A Output	50EH5
V4	Channel B Output	50EH5

* Alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	583021	PR4-250	BBRQ0926.5	WQ410	TDLD-13	TVAS-2459 *	
B	80	150					TD-20-150	TVA-1418	
C	20	150							
C2	10	150	581053	PRS1410	BBR10-150	TC42	TD-10-150	TVA-1406	
C3	100	15		PRS1200	BBR100-15	TC2501	TD-100-15	TVA-1160	①

① Some versions may use 25V in this application (Part #581027).
*Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	3000		SI 3000	D6-302	BYA10D3	CCD-302	GP230	10TS-D30
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	390 N750		N750-SI 390	TCN-390				10TCU-T39
C9	680		1468-00068	D6-681	5W5T68	CM-19B-681M	MCJ255	1FM-368
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C13	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	3000		SI 3000	D6-302	BYA10D3	CCD-302	GP230	10TS-D30
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	390 N750		N750-SI 390	TCN-390				10TCU-T39
C18	680		1468-00068	D6-681	5W5T68	CM-19B-681M	MCJ255	1FM-368
C19	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C22	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

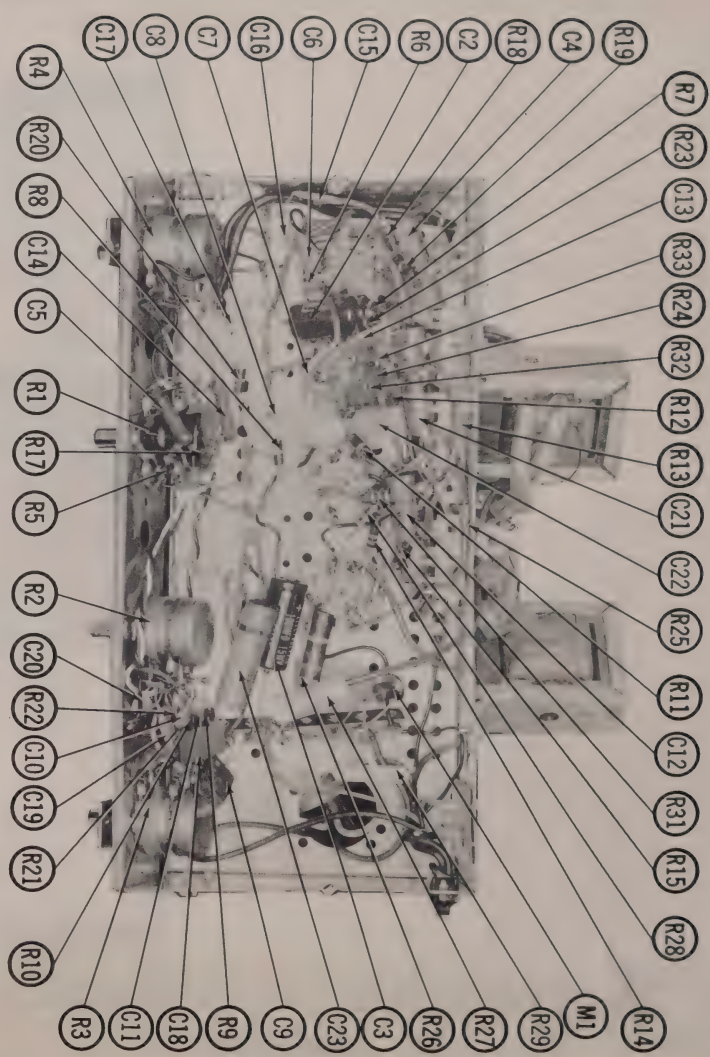
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg*		368037					Loudness, Channel A
B	3.25meg*							Loudness, Channel B
R2A	1meg		368074	B-69	AD47-1meg-B		FA16L	Bass, Channel B
B	1meg			SR-69	Not Req.		RU16L	Bass, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	1meg		368074	B-69	AD47-1meg-B		FA16L	Treble, Channel B
B	1meg			SR-69	Not Req.		RU16L	Treble, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	3meg		368062					Balance, Channel A
B	3meg							Balance, Channel B

* Taps @ 1meg & 2meg.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K	
R6	6.8meg	
R7	100K	
R8	100K	
R9	27K	
R10	100K	
R11	100K	
R12	2200Ω 1W	
R13	6800Ω	(47K) *
R14	470K	

ITEM No.	RATING	REMARKS
R15	33Ω	
R16	15Ω	
R17	100K	
R18	6.8meg	
R19	100K	
R20	100K	
R21	27K	
R22	100K	
R23	100K	
R24	2200Ω 1W	

ITEM No.	RATING	REMARKS
R25	6800Ω	(47K) *
R26	470Ω 2W	
R27	125Ω 5W	IRC#PW5-125Ω
R28	4700Ω	
R29	47Ω 5W	IRC#PW5-47Ω
R30	15Ω	
R31	470K	
R32	470K	Note 1
R33	470K	Note 1

* Alternate Value.
Note 1. Not used in some versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω	60Ω	430563					
		SEC. 2						
		3-4Ω CT						
T2	2600Ω	SEC. 1 60Ω	430563					
		SEC. 2						
		3-4Ω CT						

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	408006	8A31	
SP2	4"	PM	3-4Ω	404003	4A07	
SP3	8"	PM	3-4Ω	408006	8A31	
SP4	4"	PM	3-4Ω	404003	4A07	

POWER RECTIFIERS

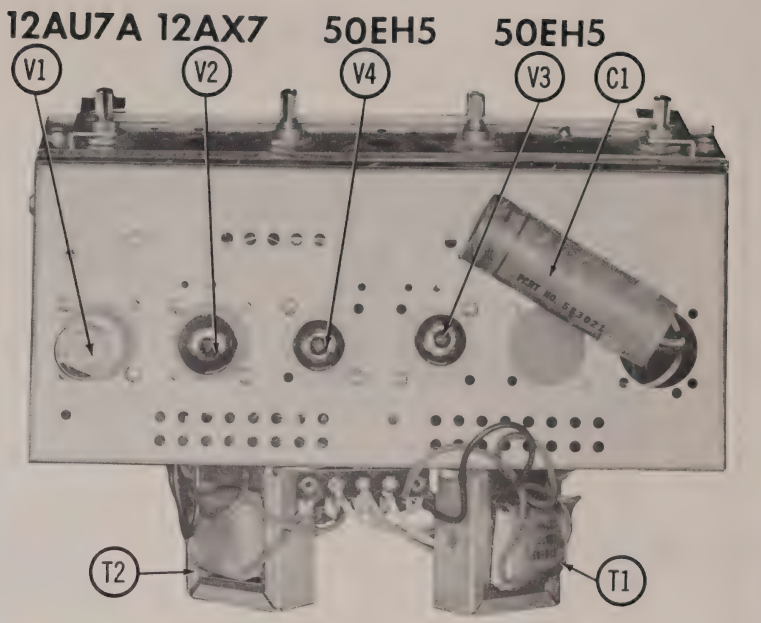
ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.080A	380020	1N1763	F-4	SR200	Silicon Type

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA STEELMAN PART No. CARTRIDGE	STEELMAN NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE NEEDLE*	NOTES
M2			13TB	Not Req.	26S	S1-1 * S1-3 *	8TA4-S	N-8TA-S *	

CHASSIS—TOP VIEW



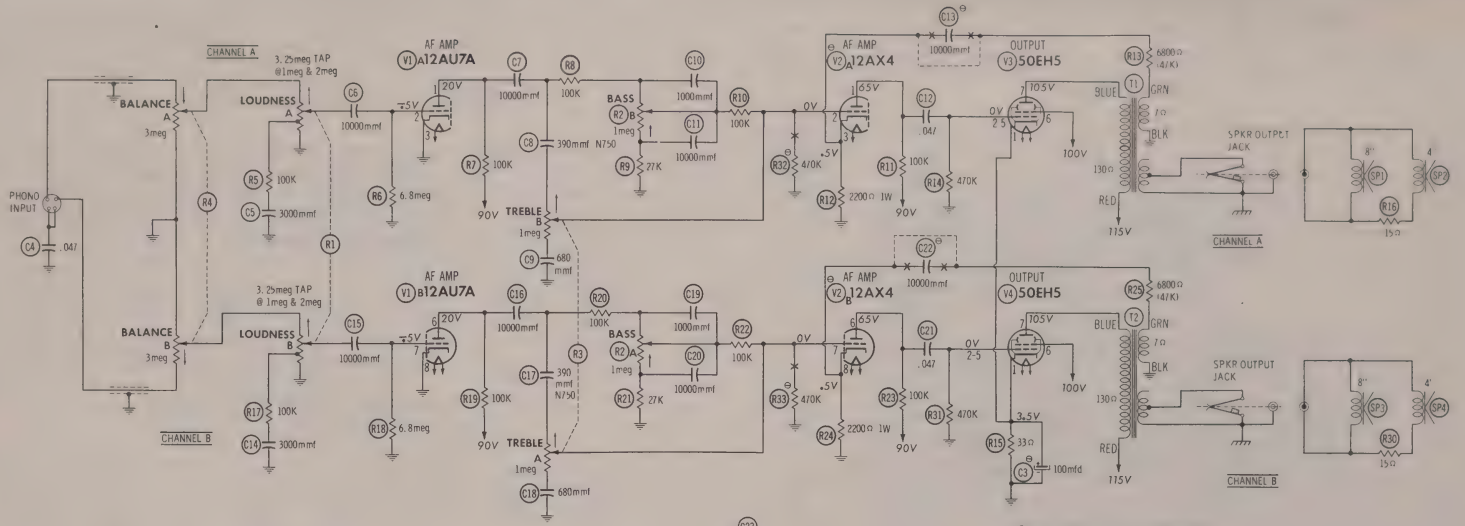
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	272334	Gold, Loudness, Bass, Treble, Balance
Knob	272335	Nickel , Loudness, Bass, Treble, Balance
Cabinet	241610	Tan
Cabinet	241620	Charcoal

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	†105K	6.8meg	0Ω	10Ω	0Ω	†105K	6.8meg	0Ω	5Ω
V2	12AX7	†105K	130K	2200Ω	20Ω	10Ω	†105K	130K	2200Ω	15Ω
V3	50EH5	33Ω	470K	140Ω	80Ω	470K	†595Ω	†255Ω		
V4	50EH5	33Ω	470K	80Ω	20Ω	470K	†595Ω	†255Ω		

† MEASURED FROM OUTPUT OF M1.

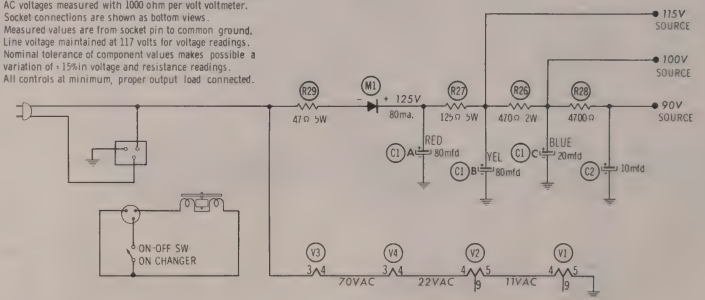
DENOTES B- — C23 .047 — DENOTES CHASSIS

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STEELMAN MODEL 406

PHOTOFACT® Folder with CIRCUITRACE®

UHER MODEL
Stereo Record III

UHER MODEL
Stereo Record III

UHER MODEL
Stereo Record III

GENERAL INFORMATION

The Uher Stereo Record III is a four-track stereo tape recorder. The unit will record and play back four-track stereo tapes. Two-track monophonic tape may be played back on the unit.

Recordings may be made from a microphone, radio, phonograph, or television receiver.

This model has three tape speeds, 7 1/2, 3 3/4, and 1 7/8 ips. Using a four-track tape, recording times are as follows.

Length	7 1/2 ips	3 3/4 ips	1 7/8 ips
1200 ft.	1 hour	2 hours	4 hours
1800 ft.	1 1/2 hours	3 hours	6 hours
2400 ft.	2 hours	4 hours	8 hours

This recorder is designed to operate on 110, 125, 160, 220, or 240 volts AC, 50 or 60 cycles.

Supplied By:

Kimberly International, Ltd.
Suite 207
1650 Broadway
New York 19, New York

SET 516 FOLDER 17

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

CQ440

On-Off and Speed Selector

Turning this control clockwise turns on the power to the recorder. Turning it counterclockwise turns the power off.

To change speeds, the control must be in the off position. With the control at the bottom position the speed is 7 1/2 ips (19.05 cms. p. s.); at the center position the speed is 3 3/4 ips (9.53 cms. p. s.); at the top position the speed is 1 7/8 ips (4.75 cms. p. s.).

Volume

The Volume control is a dual control used for monitoring a recording, or playback of a recording either through the built-in speakers, external speakers, or earphones.

In Monaural operation, the small upper knob is used for track number 1 and 2; the large lower knob is used for track number 3 and 4.

In Stereo operation the two controls are used in combination. The index marks on the knobs, when in an identical position, indicate that the volume level is the same for both channels.

NOTE: When the recorder is connected to a stereo amplifier system, the setting of the Volume controls is of no consequence. The built-in speakers may be turned off by pulling the small knob up.

Tone

The twin Tone controls adjust the tone during playback of a recording. The controls are rotated clockwise for treble and counterclockwise for bass. The small upper knob is for track 1 and 2; the large lower knob for track 3 and 4 on Monaural operation. For Stereo, both controls are used. Identical setting of the index marks on the controls indicate identical tone adjustment of the two channels.

Modulation

The Modulation control adjusts the recording level of the unit. By turning the control clockwise, the loudest peaks will cause the luminous bands to move in contact with the green area of the indicator.

Fade-Over

This control permits fading over from one signal to another, such as from microphone to radio, during a recording operation. To do this, connect the microphone to the microphone jack, and the radio to the radio jack. To fade-over from one signal to the other, turn the control either clockwise or counterclockwise depending on the setting. This will fade one signal out and bring the other one in.

Start Key

When the Start key is depressed the tape will start for playback.

Stop Key (Large)

Depressing the large Stop key will stop the tape by releasing the other keys.

Stop Key (Small)

Depressing the small Stop key will stop the tape. The key is released by depressing it all the way down. This key is intended for short pauses during playback or recording.

Sliding Key

This key (marked with arrows) is the fast forward—fast rewind control. Moving the key to the left, places the unit in the fast rewind mode; moving the key to the right, places the unit in the fast forward mode.

Recording Button

Depressing this button energizes the recording circuit. The button is held down by depressing the Start Key.

Playback Track Selector Keys

These keys are located on the left side of the recorder. With the left key depressed, the recorder will play back tracks one and two. With the right key depressed, the recorder will play back tracks three and four. With both keys depressed, the recorder is set up for stereo playback. When neither key is depressed, the recorder is set for stereo playback in reverse.

Recording Track Selector Keys

These keys are located on the right side of the recorder. With the left key depressed, the recorder is set up for monaural recording on tracks one and two. With the right key depressed, the recorder is set up for monaural recording on tracks three and four. When both keys are depressed, the recorder is set up for stereo recording.

Recording Level

The two bands of the recording level indicator operate independently of each other. The upper band operates when recording on track one and two. The lower band operates when recording on tracks three and four. When recording stereo, both bands will be operative.

Automatic End-of-Tape Stop

The recorder will be automatically stopped when the metallic control foils on the ends of the recording tape pass through the tape stop. The foil actuates a relay circuit which in turn releases the depressed keys. This feature will work only on tapes provided with control foils.

Index Counter

When starting a new recording, set the index counter to zero. Logging the tape at different points makes it easy to locate any given part of a recording.

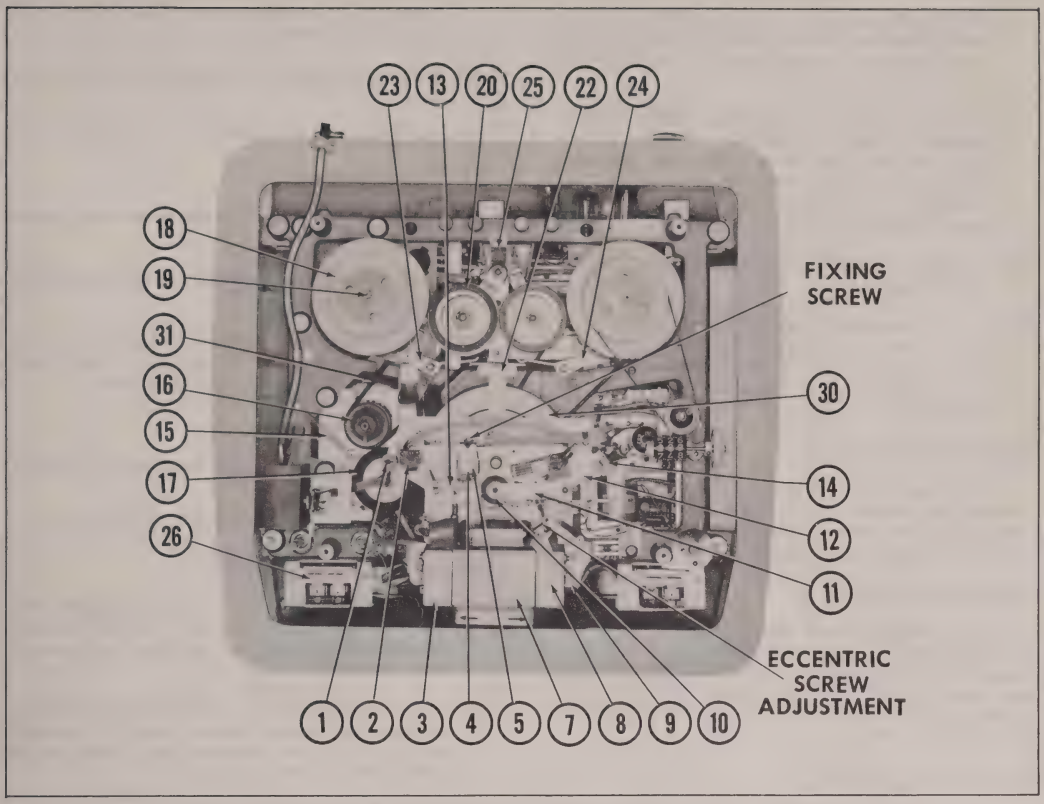


FIG.1 TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

OPERATING INSTRUCTIONS

Speed Selector

To select the desired speed, move the On-Off switch to the Off position. Pull the knob up to the top position for 1 7/8 ips (4.75 cms. p. s.), to the middle position for 3 3/4 ips (9.53 cms. p. s.), and to the bottom position for 7 1/2 ips (19.05 cms. p. s.).

CAUTION: Do not attempt to operate this control with the recorder on. Make sure the control is in the off position (counterclockwise) before the control is moved up or down.

Threading Tape

1. Place a reel of tape on the left-hand turntable, and an empty reel on the right-hand turntable.
2. Unwind about 12" of tape from the supply reel and hold a section of it taut. Insert this section into the tape guides, making certain the dull-coated side faces the rear of the recorder.
3. Insert the free end of the tape into one of the radial slots in the hub of the takeup reel. Turn the reel several turns to secure the tape to the reel and take up all slack between reels.

To Record from Microphone (Monaural)

Recording On Track No. 1.

1. Turn the fade-over control completely clockwise.
2. Connect microphone to Micro I/Stereo Micro jack.
3. Depress the left recording track selector key.
4. Depress the left playback track selector key.
5. Turn both Volume control knobs to their extreme counterclockwise position.
6. Depress small Stop key to its first position.
7. Hold down Recording button and depress Start key.
8. Place the microphone close to the signal source. Optimum distances are as follows:

Speech	12 to 20 inches
Solo	40 inches
Orchestra	7 ft.

9. Turn the Modulation control clockwise until the loudest peaks cause the bands of the recording level indicator to touch the green area in the middle.

10. Depress the small Stop key all the way down to release it. This will start the recording operation. To avoid recording undesirable portions, depress the small Stop key down to its first position. To start the tape again, depress the small Stop key all the way down.

11. To stop the recording operation, depress the large Stop key.

NOTE: The recording may be monitored by turning the small upper volume control knob clockwise. Care should be taken not to turn the knob too far and cause acoustic feedback.

Recording On Track No. 2

When the tape is all wound onto the takeup reel, reverse the position of the reels on the turntables. Track No. 2 can now be recorded by following the instructions under "Recording on Track No. 1".

Recording On Track No. 3

To record on track No. 3, again reverse the position of the two reels after track No. 2 has been recorded. Depress the right recording and playback track selector keys. For monitoring on Track 3 and 4, use the large lower volume control knob. Be sure to turn down the small volume control knob.

Recording On Track No. 4

To record on track No. 4, follow procedure under "Recording On Track No. 2".

Recording from Microphone (Stereo)

1. Turn Fade-Over control extremely counterclockwise.

2. Connect microphones to microphone jacks.

3. Depress both recording and playback track selector keys (two keys on each side).

4. Turn both Volume control knobs to their extreme counterclockwise position.

5. Depress small Stop key to its first position.

6. Push down red Recording button and depress Start key.

7. Place the microphones in front of the right and left part of the signal source.

8. Adjust the recording level.

NOTE: During stereo recording, both of the luminous bands of the recording level indicator will be operative.

9. Release the small Stop key to start the recording operation.

10. The recording may be monitored or interrupted by the same method used under "Recording From Microphone (Monaural)".

11. Stop the recording by depressing the large Stop key.

To Play a Recording (Monaural)

1. Thread the Tape.

2. Set the speed selector to the speed at which the tape was recorded.

3. Turn recorder on and allow sufficient time for the tubes to warm up.

4. To play back tracks 1 and 2, depress the left track selector key. To play back tracks 3 and 4, depress the right track selector key.

5. Depress Start key.

6. Adjust Volume control to the desired listening level.

7. Stop playback by depressing large Stop key.

To Play a Recording (Stereo)

1. The recorder setup is the same as under "To Play a Recording (Monaural)", except that both playback track selector keys are depressed at the same time.

2. External loudspeakers may be used by connecting them to the External Speaker jack. The internal speakers may be disconnected by pulling the small volume control knob up.

Connecting to an Amplifier System

The recorder may be connected to an amplifier system by connecting the Radio jack of the recorder to the input jack of the amplifier.

Erase

Previous recordings are automatically erased when a new recording is made. If a tape is to be erased without putting a new recording on the tape, proceed as with a regular recording, but turn the modulation control extremely counterclockwise.

Stereo Playback in Reverse

For stereo playback in reverse, the operation is the same as stereo playback, except the track selector keys remain in their up position. With this system, the channel usually played through the left loudspeaker is played through the right loudspeaker and vice versa.

Recording Duplication

To duplicate a recording, proceed as follows:

1. Connect a cable from the output jack of the playback recorder and the Radio-Phono jack of the receiving recorder.

2. Set the playback recorder for playback and the receiving recorder for Phono recording.

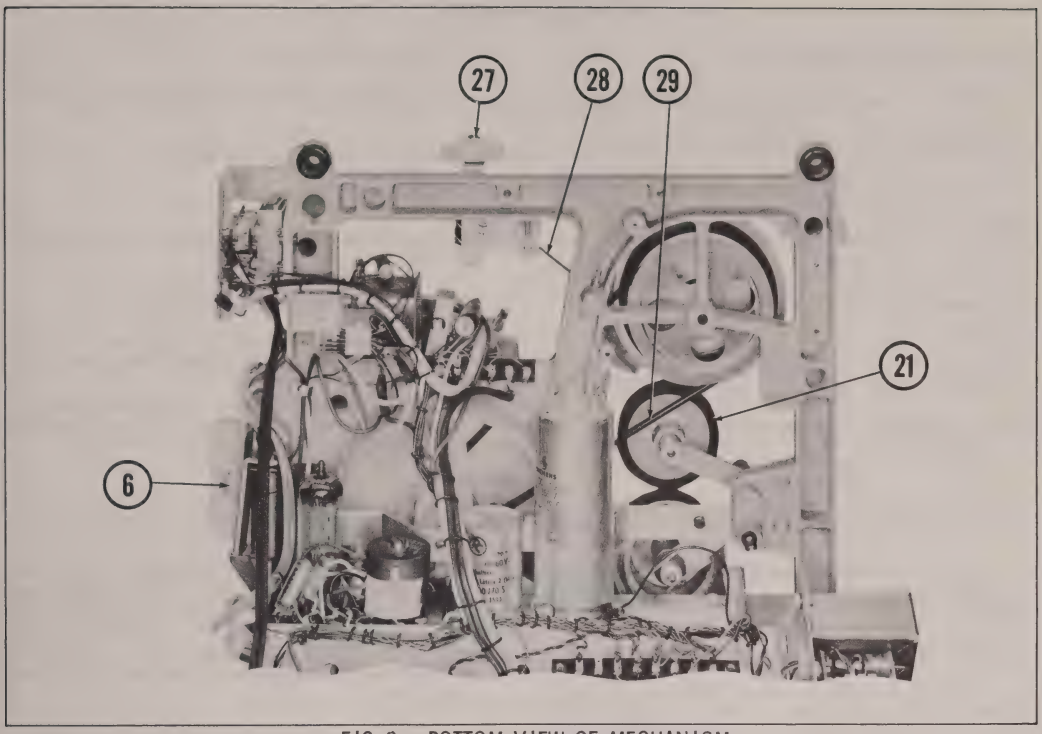


FIG.2 BOTTOM VIEW OF MECHANISM

3. Adjust the volume control of the playback recorder to a normal level.

4. Adjust the modulation control of the receiving recorder so the bands of the recording level indicator come within 3/64" of one another.

To Record from a Radio or Television Receiver

Recordings from a radio may be made by one of the following methods:

1. Through the microphone by pickup from the radio speaker. — Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Turn the radio tone control to treble or high. Set the recording level and record as described under "To Record from Microphone (Monaural)".

2. Through a direct connection to the radio loudspeaker. — Make up a shielded cable with alligator clips on one end and a plug on the other. Connect the alligator clips across the voice coil terminals of the radio speaker and insert the plug into the Radio jack. Set the input selector to Radio. Set the radio volume and tone controls as described previously. Set the recording level and proceed as described under "To Record from Microphone (Monaural)".

3. Through a direct connection to the volume control of the radio. — Make up a shielded cable with a plug on one end. Connect the other end across the volume control. Insert the plug into the Radio jack. Set the input selector to Radio. Set the recording level and proceed as described under "To Record from Microphone (Monaural)". The Radio volume and tone controls require no adjustment since they have no affect on this setup.

To Record from a Record Player

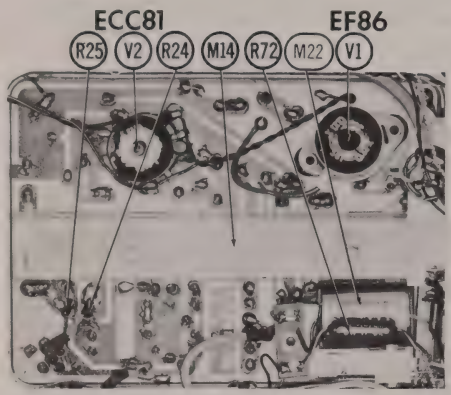
Connect the record player to the phono jack. Set the input selector to Phono. Set the modulation control until the luminous bands of the recording level indicator meet the green area in the middle. Turn the record player on and proceed as described under "To Record from Microphone (Monaural)".

CLEANING

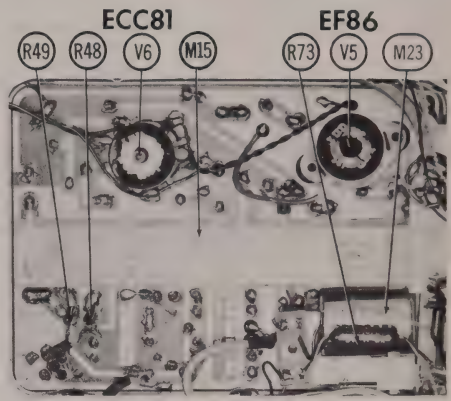
The pressure roller (10), tape guides (1) and (14), and play-record head (4) may accumulate tape residue as the tape passes over these parts. Use a soft cloth soaked in alcohol to clean these parts.

LUBRICATION

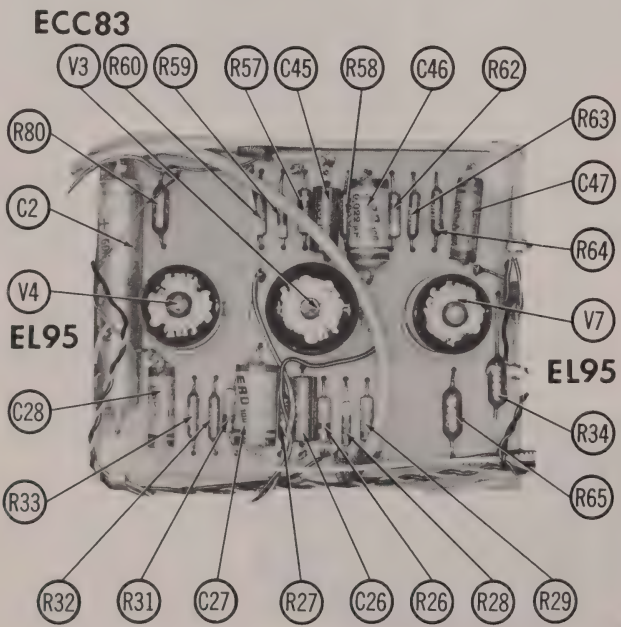
This recorder has self-oiling bearings; therefore, lubrication is not required for long periods of time unless a part has been removed for repair or replacement.



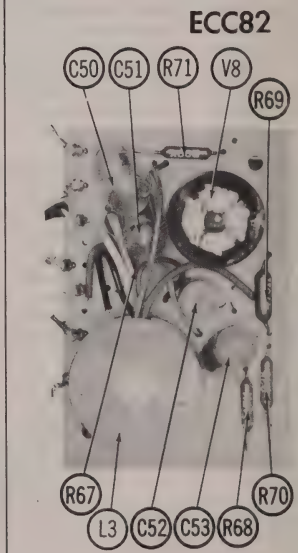
CHANNEL 1 PRINTED BOARD—TOP VIEW



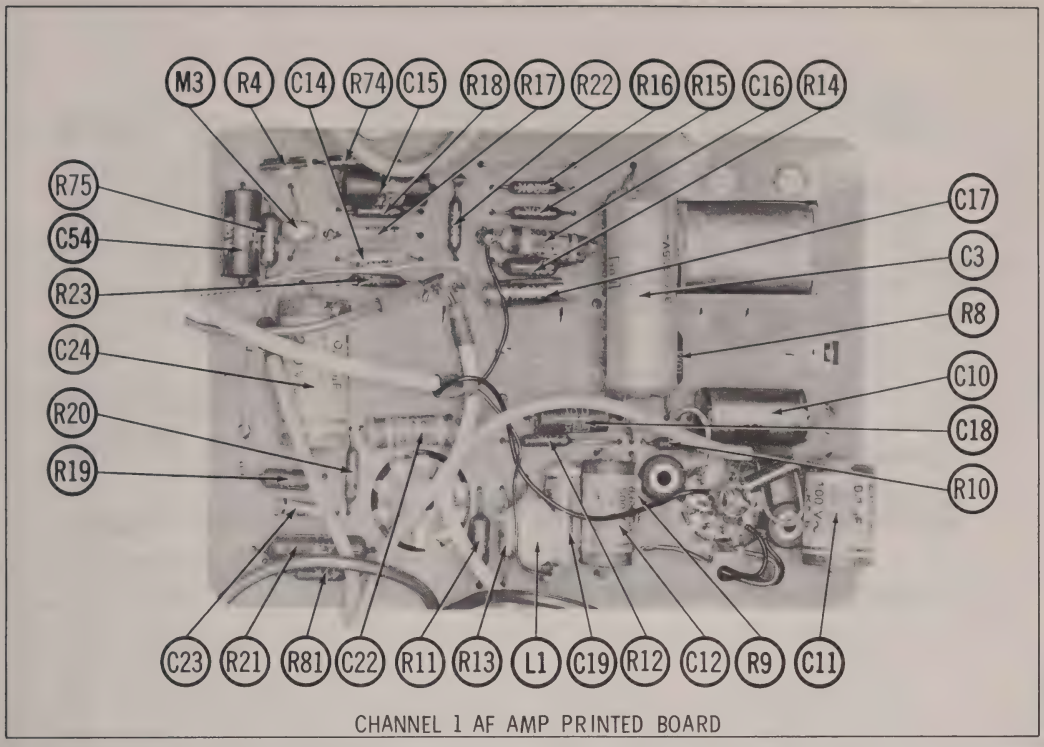
CHANNEL 2 PRINTED BOARD—TOP VIEW



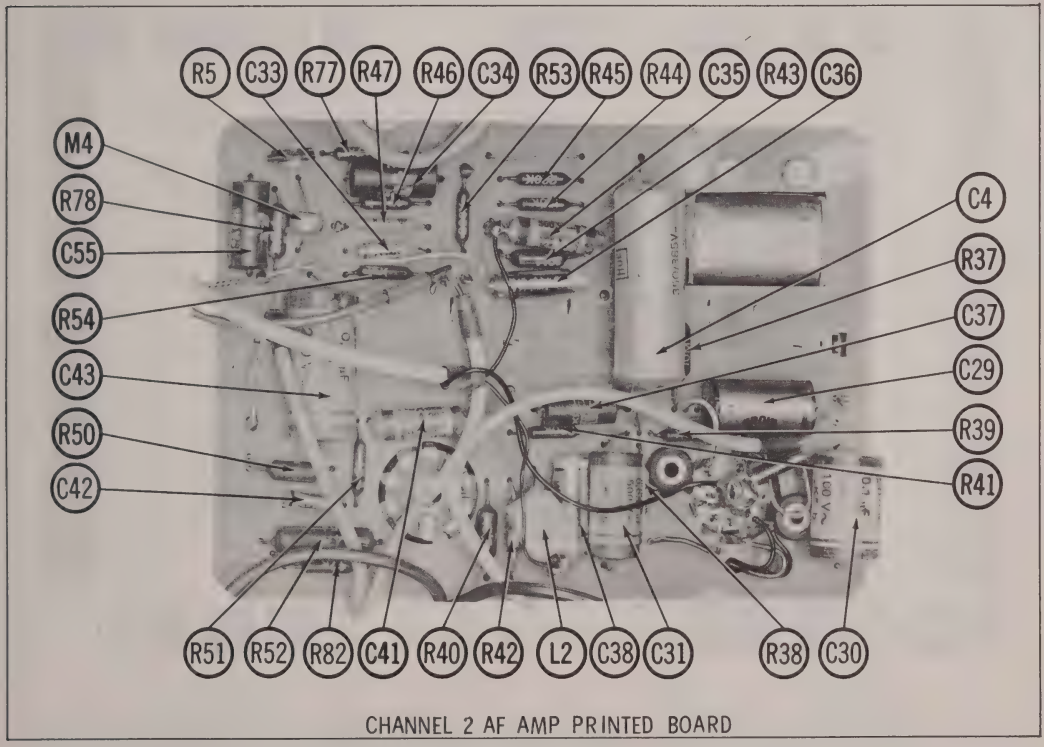
CHANNELS 1 & 2 OUTPUT PRINTED BOARD



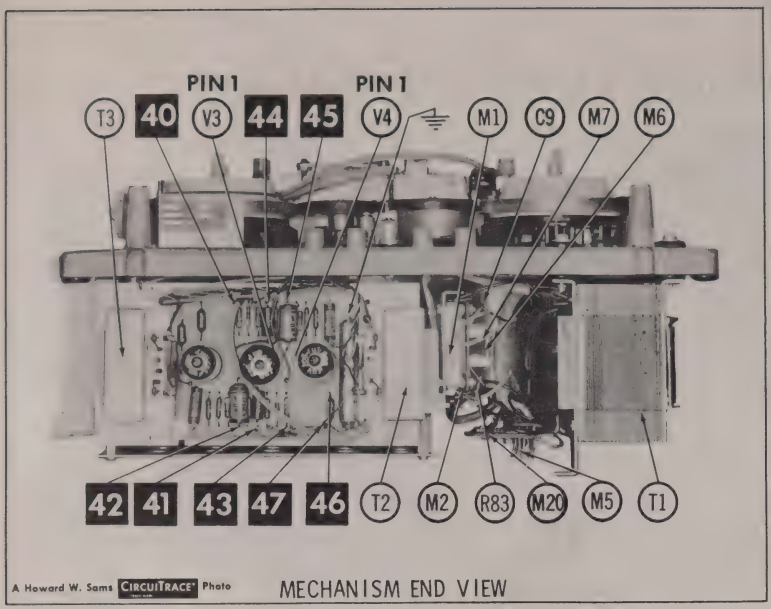
BIAS OSC. PRINTED BOARD



CHANNEL 1 AF AMP PRINTED BOARD



CHANNEL 2 AF AMP PRINTED BOARD

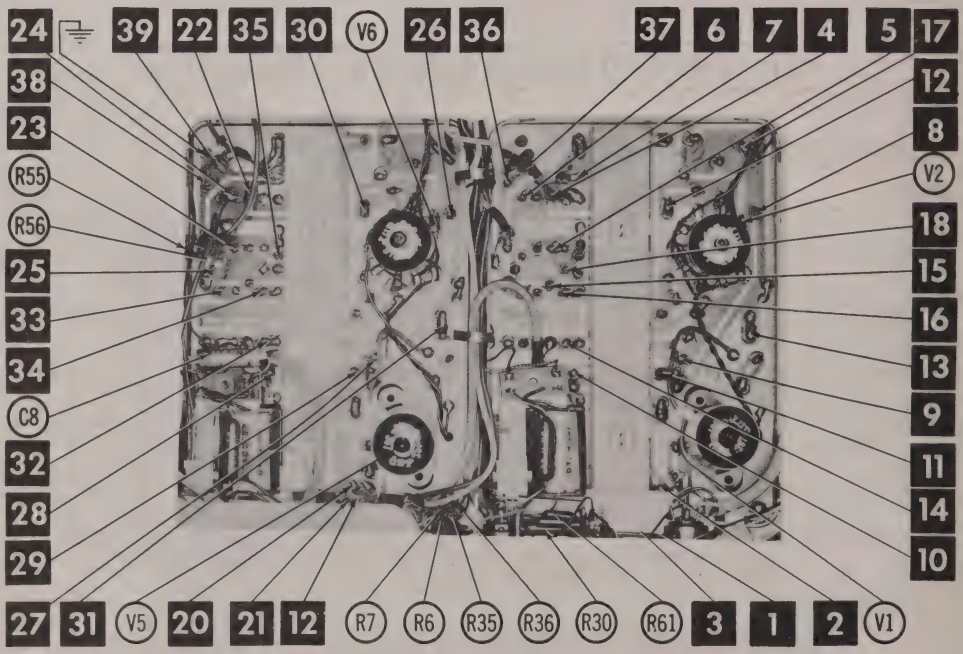


A Howard W. Sams CIRCUITRACE® Photo

MECHANISM END VIEW

A Howard W. Sams CIRCUITRACE® Photo

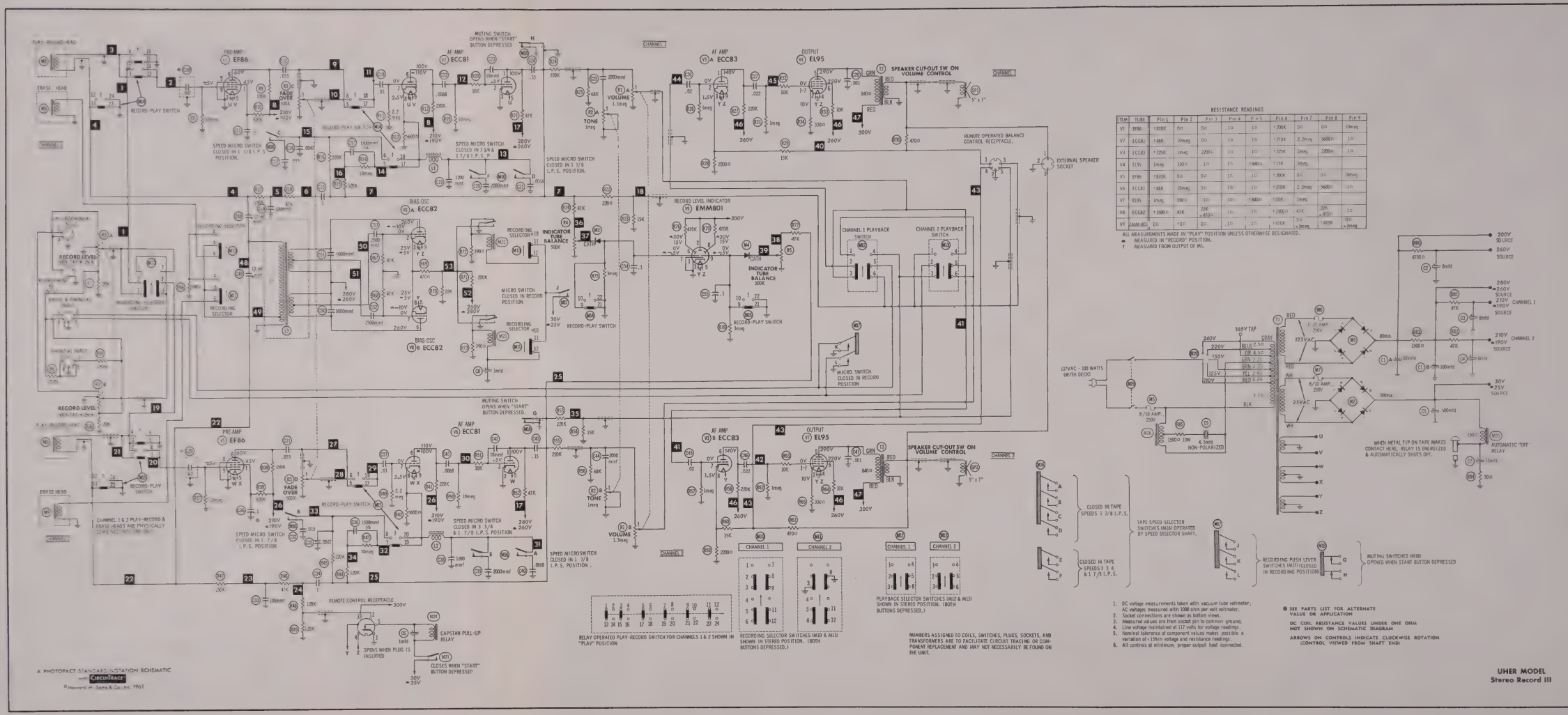
PRINTED BOARD
BIAS OSC.



A Howard W. Sams CIRCUITRACE® Photo

CHANNELS 1 & 2 AF AMP PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED


RESISTANCE READINGS
ITEM TUBE Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6 Pin 7 Pin 8 Pin 9
V1 EF86 ▪820K 0Ω 0Ω .1Ω 1Ω ▪.220K 0Ω 0Ω 10meg
V2 ECC83 ▪68K 10meg 0Ω 1Ω 1Ω ▪270K 2.2meg 560KΩ 1Ω
V3 ECC83 ▪225K 1meg 2200Ω 1Ω 1Ω ▪225K 1meg 2200Ω 1Ω
V4 EL95 1meg 330Ω 1Ω 1Ω ▪840Ω ▪15K 1meg
V5 EF86 ▪820K 0Ω 0Ω 1Ω 1Ω ▪220K 0Ω 0Ω 10meg
V6 ECC82 ▪68K 10meg 0Ω 1Ω 1Ω ▪270K 2.2meg 560KΩ 1Ω
V7 EL95 1meg 330Ω 1Ω 1Ω ▪840Ω ▪15K 1meg
V8 ECC82 ▪1500Ω 47K 22K ▪470Ω 1Ω 1.5KΩ 47K 22K ▪470Ω 1Ω
V9 EMM801 0Ω 1Ω 0Ω 1Ω 1Ω ▪470K 0Ω ▪3meg 68K ▪3meg
ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
▪ MEASURED IN "RECORD" POSITION.
† MEASURED FROM OUTPUT OF M1.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1961
UHER MODEL
Stereo Record III
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
RELAY OPERATED PLAY-RECORD SWITCH FOR CHANNELS 1 & 2 SHOWN IN "PLAY" POSITION
RECORDING SELECTOR SWITCHES (M10 & M11) SHOWN IN STEREO POSITION. (BOTH BUTTONS DEPRESSED.)
PLAYBACK SELECTOR SWITCHES (M12 & M13) SHOWN IN STEREO POSITION. (BOTH BUTTONS DEPRESSED.)
CLOSED IN TAPE SPEEDS 1 7/8 I.P.S.
CLOSED IN TAPE SPEEDS 3 3/4 & 1 7/8 I.P.S.
TAPE SPEED SELECTOR SWITCHES (M16) OPERATED BY SPEED SELECTOR SHAFT.
RECORDING PUSH LEVER SWITCHES (M17) CLOSED IN RECORDING POSITION
MUTING SWITCHES (M18) OPENED WHEN START BUTTON DEPRESSED
WHEN METAL TIP ON TAPE MAKES CONTACT HERE, RELAY IS ENERGIZED & AUTOMATICALLY SHUTS OFF.
AUTOMATIC "OFF" RELAY
CAPSTAN PULL-UP RELAY
OPENS WHEN PLUG IS INSERTED
CLOSES WHEN "START" BUTTON DEPRESSED
REMOTE CONTROL RECEPTACLE
EXTERNAL SPEAKER SOCKET
REMOTE OPERATED BALANCE CONTROL RECEPTACLE.
SPEAKER CUT-OUT SW ON VOLUME CONTROL
MUTING SWITCH OPENS WHEN "START" BUTTON DEPRESSED
SPEED MICRO SWITCH CLOSED IN 1 7/8 I.P.S. POSITION.
SPEED MICRO SWITCH CLOSED IN 3 3/4 & 1 7/8 I.P.S. POSITION
MICRO SWITCH CLOSED IN RECORD POSITION
RECORD-PLAY SWITCH
RECORDING SELECTOR
INDICATOR TUBE BALANCE
CHANNEL 1 PLAYBACK SWITCH
CHANNEL 2 PLAYBACK SWITCH
CHANNEL 1 & 2 PLAY-RECORD & ERASE HEADS ARE PHYSICALLY CLOSE TOGETHER
ERASE HEAD
RECORD-PLAY SWITCH
RECORD LEVEL
FADE OVER
SPEED MICRO SWITCH CLOSED IN 1 7/8 I.P.S. POSITION
SPEED MICRO SWITCH CLOSED IN 3 3/4 & 1 7/8 I.P.S. POSITION
SPEED MICROSWITCH CLOSED IN 3 7/8 I.P.S. POSITION .
PRE-AMP V1 EF86
AF AMP V2 ECC81
BIAS OSC V8 A ECC82
BIAS OSC V8 B ECC82
RECORD LEVEL INDICATOR V9 EMM801
AF AMP V3 ECC83
OUTPUT V4 EL95
PRE-AMP V5 EF86
AF AMP V6 ECC81
AF AMP V3 ECC83
OUTPUT V7 EL95
VOLUME 1.3meg
TONE 1meg
CHANNEL 1
CHANNEL 2
117VAC - 100 WATTS (WITH DECK)
165V TAP
240V
220V
150V
125V
110V
BLUE 2.5Ω
OR 4.5Ω
GRN 7.5Ω
BRN 7.5Ω
YEL 7.5Ω
RED 2.2Ω
BLK
3 AMP. 250V
6/10 AMP. 250V
8/10 AMP. 250V
125VAC
25VAC
80ma.
300ma
1500Ω 10W
4.5mfd NON-POLARIZED
100mfd
500mfd
8mfd
300V SOURCE
260V SOURCE
210V SOURCE
190V SOURCE
CHANNEL 1 SOURCE
CHANNEL 2 SOURCE
30V 25V SOURCE

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 Preamp.	EF86	V5	Channel 2 Preamp.	EF86
V2	Channel 1 AF Amp.	ECC81	V6	Channel 2 AF Amp.	ECC81
V3	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83	V7	Channel 2 Audio Output	EL95
			V8	Bias Oscillator	ECC82
V4	Channel 1 Audio Output	EL95	V9	Record Level Indicator	EMM801

ELECTROLYTIC CAPACITORS

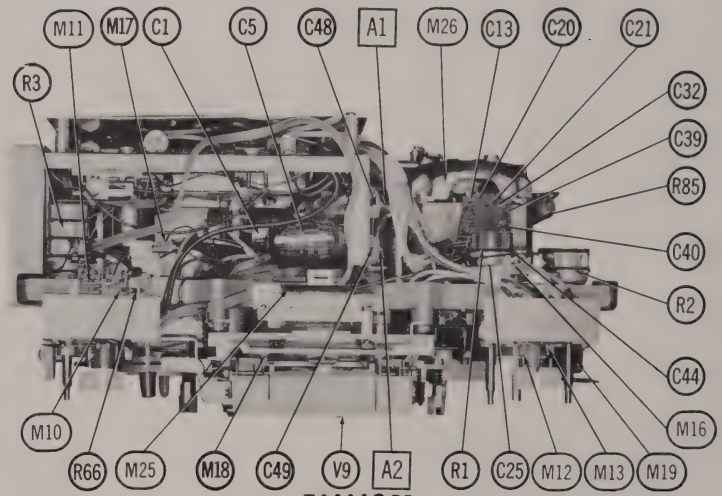
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	UHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	100	350	70303						
B	100	350							
C2	8	350	70304	PRS1610	BR835	TC61	TD-8-350	TVA-1603	
C3	8	350	70304	PRS1610	BR835	TC61	TD-8-350	TVA-1603	
C4	8	350	70304	PRS1610	BR835	TC61	TD-8-350	TVA-1603	
C5	500	70	70307						
C6	1	70	70308	PRS1700	NLW1-150	TT150X1	MLV1-150	TE-1400	
C7	10	70	70305	SRE70V10	NLW10-100	TT150X10	MLI0-100	TE-1407	
C8	1	70	70308	PRS1700	NLW1-150	TT150X1	MLV1-150	TE-1400	
C9	4.5	250	70301	RR-643					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	.047 250V	Note 1 #70309						
C11	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C12	.033 500V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-4133	6TM-S33
C13	.015 250V		P488N-015	DD-153	CUB6S15	4DP-1-153	GEM-6133	4TM-S15
C14	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C15	.1 150V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C16	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C17	1500 5%				5R5D15	CM-19B-152J	MCE456	MS-215
C18	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C19	1200		SI 1200	D6-122	L10D12	CCD-122	B-212	10TS-D12
C20	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C21	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C22	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C23	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C24	.15 500V		P688N-15		CUB6P15	6DP-5-154	GEM-6015	6TM-P15

MECHANISM—REAR VIEW



EMM801

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C25	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C26	.02 150V		P288N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	2TM-S20
C27	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C28	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C29	.047 250V	Note 1 #70309						
C30	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C31	.033 500V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C32	.015 250V		P488N-015	DD-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C33	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C34	.1 150V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C35	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C36	1500 5%				5R5D15	DM-19B-152J	MCE456	MS-215
C37	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C38	1200		SI 1200	D6-122	L10D12	CCD-122	B-212	10TS-D12
C39	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C40	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C41	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C42	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C43	.15 500V		P688N-15		CUB6P15	6DP-5-154	GEM-6015	6TM-P15
C44	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C45	.02 150V		P288N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	2TM-S20
C46	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C47	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C48	10-60					404		
C49	10-60					404		
C50	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C51	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C52	2500		SI 2500	D6-252	BYA10D25	CCD-252	GP225	10TS-D25
C53	2500		SI 2500	D6-252	BYA10D25	CCD-252	GP225	10TS-D25
C54	.1 150V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C55	.1 150V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

Note 1. Shielded Unit. # UHER Part Number.

RESISTORS (IRC or EQUIVALENT) (cont)

ITEM No.	RATING	REMARKS
R12	220K	
R13	5600Ω	
R14	10meg	
R15	120K	
R16	220K	
R17	150K	
R18	47K	
R19	10meg	
R20	10K	
R21	47K	
R22	220Ω	
R23	15K	
R24	220K	
R25	68K	
R26	1meg	
R27	220K	
R28	2200Ω	
R29	15K	
R30	470Ω	
R31	1meg	
R32	10K	
R33	10K	
R34	330Ω	
R35	1meg	
R36	20K	

ITEM No.	RATING	REMARKS
R37	10meg	
R38	150K	
R39	820K	
R40	2.2meg	
R41	220K	
R42	5600Ω	
R43	10meg	
R44	120K	
R45	220K	
R46	47K	
R47	150K	
R48	120K	
R49	120K	
R50	10meg	
R51	10K	
R52	47K	
R53	220K	
R54	15K	
R55	220K	
R56	68K	
R57	1meg	
R58	220K	
R59	2200Ω	
R60	15K	
R61	470Ω	

ITEM No.	RATING	REMARKS
R62	1meg	
R63	10K	
R64	10K	
R65	330Ω	
R66	390Ω	
R67	47K	
R68	47K	
R69	470Ω	
R70	22K	
R71	200K	
R72	390Ω	
R73	390Ω	
R74	47K	
R75	3meg	
R76	470K	
R77	47K	
R78	3meg	
R79	470K	
R80	4700Ω	
R81	47K	
R82	47K	
R83	1500Ω	
R84	30Ω	
R85	1500Ω 10W	IRC#PW10-1500Ω

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		UHER PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	RF Choke	BV2404				
L2	RF Choke	BV2404				
L3	Bias Osc.	BV6A2				

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	UHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1.3meg	1/10	70513					Volume, Tracks 3-4
B	1.3meg							Volume, Tracks 1-2
C	Switch							Push-Pull Speaker Off-On
R2A	1meg	1/10	70503					Tone, Tracks 3-4
B	1meg							Tone, Tracks 1-2
R3A	500K	1/10	70514					Record Level, Tracks 3-4
	250K Tap							
B	500K							Record Level, Tracks 1-2
	250K Tap							
C	500K	1/10						Fade Over, Tracks 3-4
D	500K							Fade Over, Tracks 1-2
R4	500K	1/10	70510					Indicator Tube Bal., Tracks 1-2
R5	500K	1/10	70510					Indicator Tube Bal., Tracks 3-4

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	UHER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	240V Tap ⓐ220V, 180V, 165V 150V, 125V, 110V, ⓐ.9A	250V ⓐ .15A	6.3VCT ⓐ .6A	70614					
	SEC. 3	SEC. 4	SEC. 5						
	6.3VCT ① .6A	6.3VCT ⓐ2.1A	26V ⓐ .44A						

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R6	1meg	
R7	20K	

ITEM No.	RATING	REMARKS
R8	10meg	
R9	150K	

ITEM No.	RATING	REMARKS
R10	820K	
R11	2.2meg	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	UHER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9000Ω	3-4Ω	70605	A-2932①	A-3879①	24S98①	S-17X①	① Drill New Mounting Hole.
T3	9000Ω	3-4Ω	70605	A-2932①	A-3879①	24S98①	S-17X①	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	UHER PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	70802	57A15	
SP2	5"x 7"	PM	3-4Ω	70802	57A15	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	UHER PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.080A	70204 *				* Selenium (Bridge Type)
M2	.300A	70202 *				♦ Selenium
M3		70205 ♦				
M4		70205 ♦				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			UHER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5		8/10A 250V						
M6		3/10A 250V						
M7		6/10A 250V						

MISCELLANEOUS

ITEM No.	PART NAME	UHER PART No.	NOTES
M8	Head	70155	Playback (Channel 1, Channel 2)
M9	Head	70157	Erase (Channel 1, Channel 2)
M10	Switch	70159	Recording Selector 1
M11	Switch	70160	Recording Selector 2
M12	Switch		Playback (Channel 1)
M13	Switch		Playback (Channel 2)
M14	Switch		Record-Play Switch(Relay Operated) Channel 1
M15	Switch		Record-Play Switch(Relay Operated) Channel 2
M16	Switch		Tape Speed-Selector(Operated by Speed Selector Shaft)
M17	Switch Contacts		Actuated by Recording Push Lever
M18	Switch Contacts		Muting (Opens When Start Button is Depressed)
M19	Switch		Power Off-On (Operated by Speed Selector Lever)
M20	Switch		AC Input Selector
M21	Switch		Contacts (Close When Start Button is Depressed)
M22	Relay	BV 4/207	Record-Play (Include Switch Contacts) Channel 1
M23	Relay	BV 4/207	Record-Play (Include Switch Contacts) Channel 2
M24	Relay	BV 4/206	Capstan Pull-Up
M25	Relay	BV 4/208	Auto Shut-Off
M26	Motor	70001	Drive

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

INDEX

A cumulative index is included as a part of this Folder. Upon finding that a new tube is not listed on the roll chart of a tester covered in this service, refer to the latest Tube Tester Data Index to determine in which PHOTOFACT Set the data was published. If listed, reference to that Folder will provide the necessary data.

TUBE TYPES	JACKSON 598, 648, and 658	TUBE TYPES	JACKSON 598, 648, and 658	TUBE TYPES	JACKSON 598, 648, and 658
1H2	500	6EW7	504	12DW7	504
1N2	500	6FE5	500	12DY8	516
2ES5	500	6FE8	500	13EM7	512
2EV5	512	6FG5	500	14GT8	500
2FY5	512	6FG7	516	15EW6	508
3DG4	500	6FQ5	512	17EW8	508
3EV5	512	6FV8	504	22DE4	500
4GS8	516	6FW8	500	34GD5	508
6CD7	512	6FY5	508	35GL6	500
6CW7	504	6GM6	500	50BM8	504
6EH7	500	6GY8	504	50FE5	500
6EJ7	500	6HJ8	516	7167	508
6EM7	500	7DJ8	504	7408	500
6EQ7	516	8ET7	516	7543	500
6EU7	500	9EF6	508	7591	504
6EV5	500	10EW7	504	7695	512
6EV7	504				

JACKSON MODEL 598

SET 516

SUPPLEMENTS LATEST ROLL CHART 598-2

Tube Type	A.	B.	C.	Fil. Cont.	D.	E.	F.	G.
4GS8	4.2	4		5	3	67Z	2	60
	"	4			8	79Z	2	60
6EQ7	6.3	4		5	7	2	6	41
	"	4	Z		8			56
6FG7	6.3	4		5	6	9Z	7	85
	"	4Z			2	1		34
6HJ8	6.3	4Y		5	6	2	3	43
	"	4			8	Z		50
8ET7	8.4	4Y		5	9	7	8	22
	"	4			2			59
	"	4			3			59
12DY8	12.6	4Y	Z	5	8	9		49
	"	4Y	Z		6	1	3	33

JACKSON MODEL 648

SET 516

SUPPLEMENTS LATEST ROLL CHART 648-23C

Tube Type	Fil.	D.	E.	Plate Test
4GS8	4.2	A1249	358	65 XZ
	"	"	AB567	"
6EQ7	6.3	1234	B589	39 V
	"	123	7	95 X
6FG7	6.3	A123	AC689	23 XZ
	"	"	AC45	43 V
6HJ8	6.3	A1256	AB348*	18 WY
	"	129	7	35 Y
8ET7	8.4	A128	679	43 Z
	"	124	5	94 X
	"	"	3	"
12DY8	12.6	A129	AC67	70 X
	"	A125	AB348	53 X

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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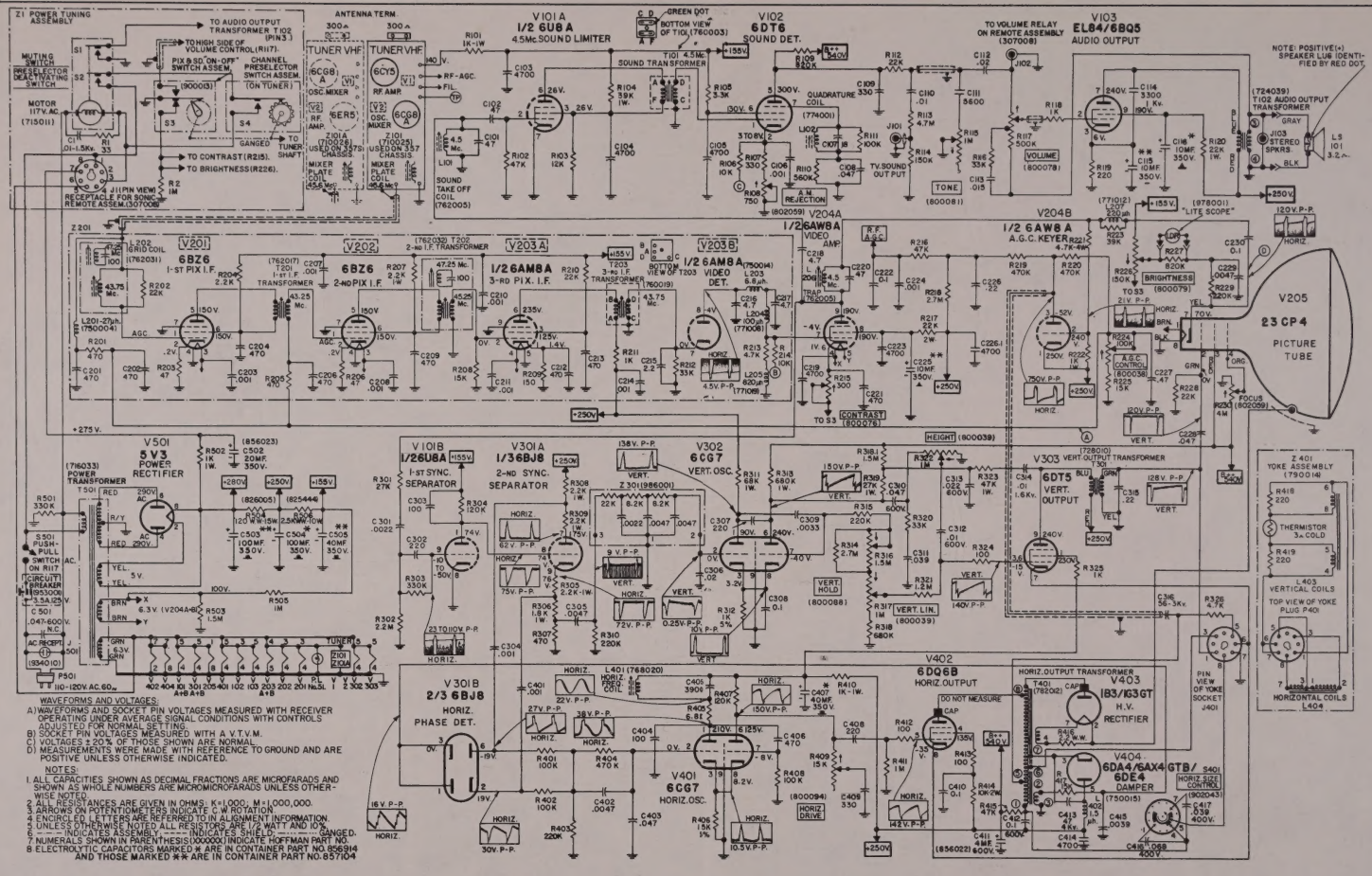
TUBE TESTER DATA • SET 516

JACKSON
MODEL 658

SET 516

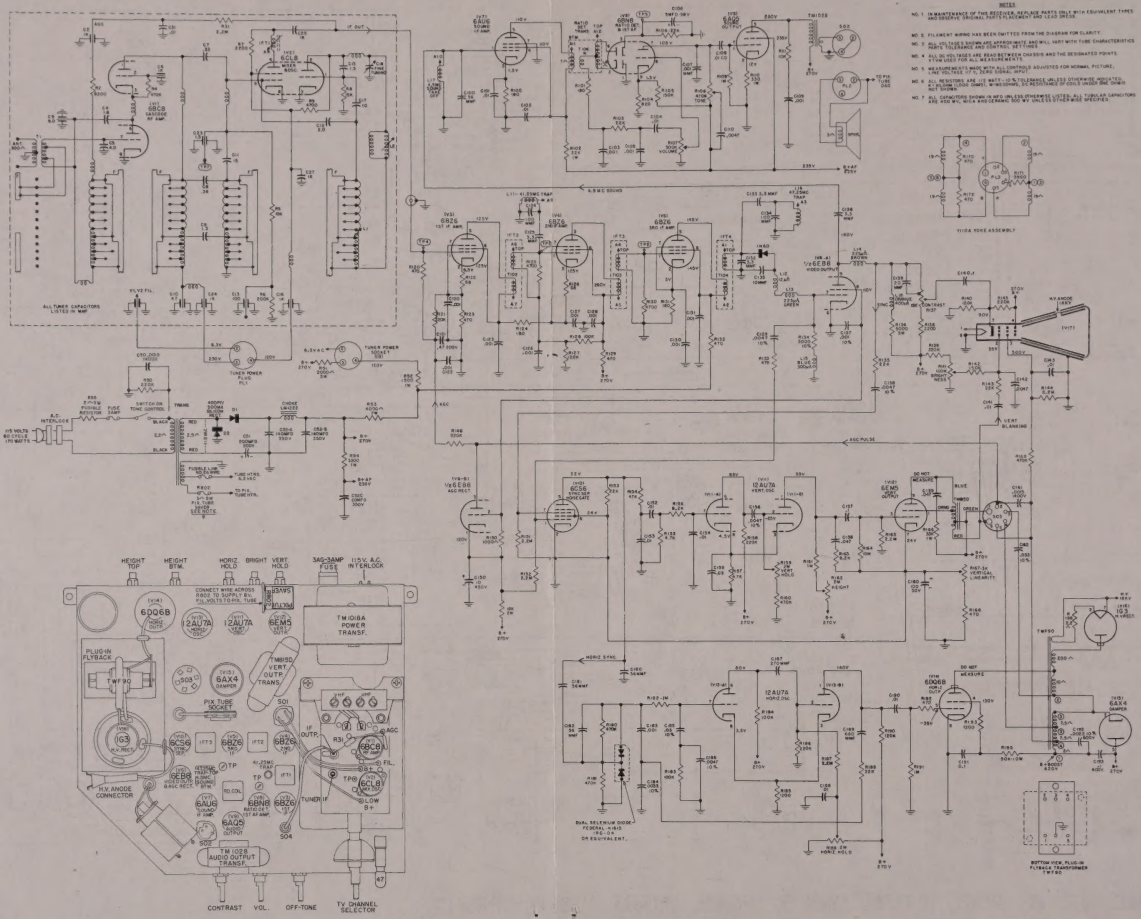
SUPPLEMENTS LATEST ROLL CHART 658-3

Tube Type	Sec.	Circuit Heater	H-K	P-G	Plate	Grid Test	Heater Current	
4GS8	P	4.0N	1249	358	55S	15XY•		
	P	"	"	ab567	"	15XY•	A10.6J	Z450
6EQ7	P	6.4J	1234	b589	34S	15XY•		
	D	"	123	7	95S	X		
6FG7	P	6.4J	123	ac689	44R	15WY•		
	T	"	"	ac45	22R	15WY•	A13.6E	Z450
6HJ8	P	6.4K	1246	ab358	37R	10WY•		
	D	"	129	7	50R	X	A13.6H	Z450
8ET7	P	8.5H	128	679	28R	25VY•		
	D	"	124	5	89R	X		
	D	"	"	3	"	X	A18.6J	Z600
12DY8	T	13.6G	129	ac67	83U	5XY•		
	T	"	125	ab348	22U	15WY•		



HOFFMAN MODELS BR3813, BR3823, BR3833, BR3843, MR3813, MR3823, MR3833, MR3853, SPR3813, SPR3833, SPR3853, WR3813, WR3823, WR3833, WR3843, WR3853 (CH. 357, 359)

Schematic Diagram Courtesy of Hoffman Electronics Corporation



SETCHELL-CARLSON MODELS TL61, 19C61, 19T63, 61C (CH. 361)

Schematic Diagram Courtesy of Setchell-Carlson Inc.

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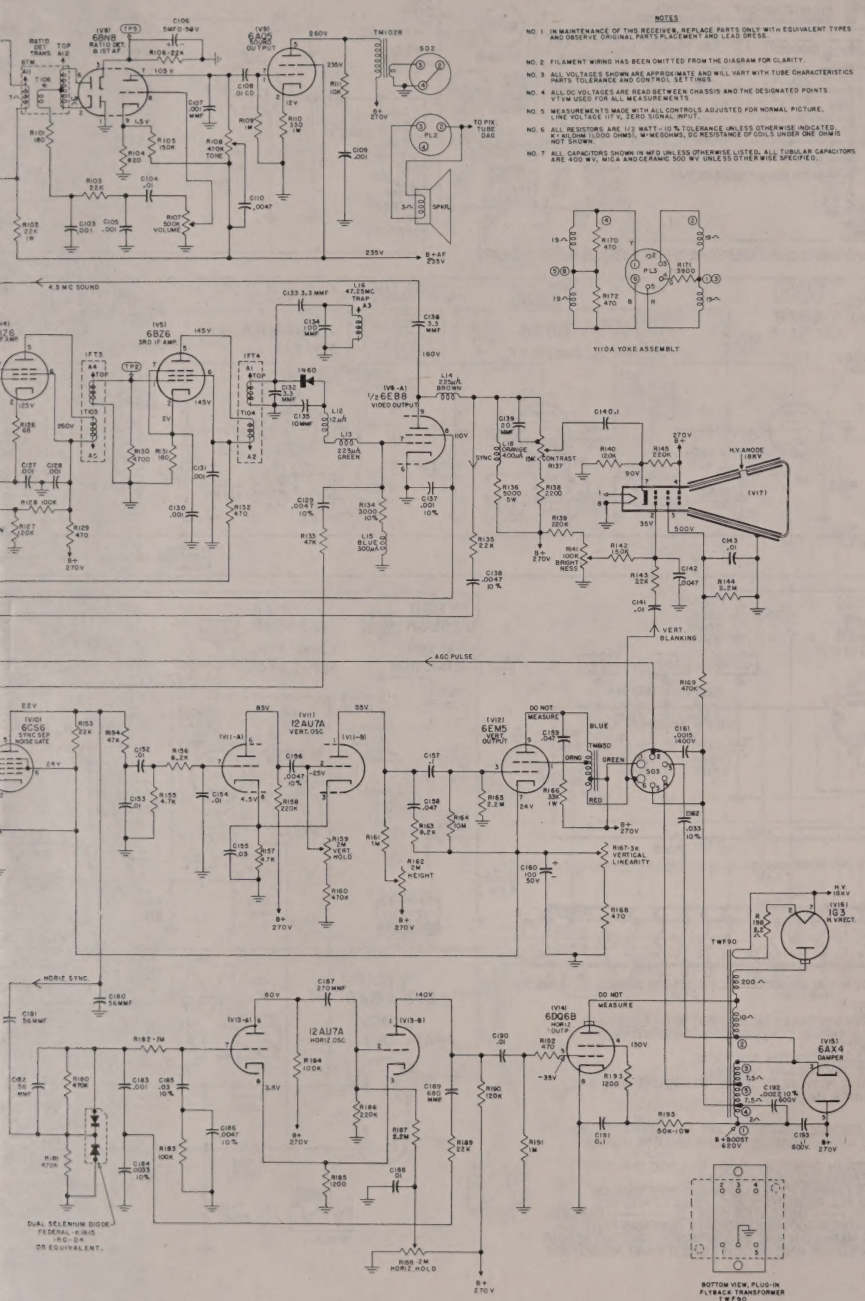
NOTES
NO. 1. IN MAINTENANCE OF THIS RECEIVER, REPLACE PARTS ONLY WITH EQUIVALENT TYPES AND OBSERVE ORIGINAL PARTS PLACEMENT AND LEAD DRESS.
NO. 2. FILAMENT WIRING HAS BEEN OMITTED FROM THE DIAGRAM FOR CLARITY.
NO. 3. ALL VOLTAGES SHOWN ARE APPROXIMATE AND WILL VARY WITH TUBE CHARACTERISTICS PARTS TOLERANCE AND CONTROL SETTINGS.
NO. 4. ALL DC VOLTAGES ARE READ BETWEEN CHASSIS AND THE DESIGNATED POINTS. VTVM USED FOR ALL MEASUREMENTS.
NO. 5. MEASUREMENTS MADE WITH ALL CONTROLS ADJUSTED FOR NORMAL PICTURE. LINE VOLTAGE 117 V, ZERO SIGNAL INPUT.
NO. 6. ALL RESISTORS ARE 1/2 WATT ±10 % TOLERANCE UNLESS OTHERWISE INDICATED. K=KILOHM (1,000 OHMS), M=MEGOHMS, DC RESISTANCE OF COILS UNDER ONE OHM IS NOT SHOWN.
NO. 7. ALL CAPACITORS SHOWN IN MFD UNLESS OTHERWISE LISTED. ALL TUBULAR CAPACITORS ARE 400 WV, MICA AND CERAMIC 500 WV UNLESS OTHERWISE SPECIFIED.
RATIO DET TRANS
TOP ADJ
(V3) 6BN8 RATIO DET & 1ST AF
(V5) 6BZ6 3RD IF AMP
(V8-A) 1/2 6EB8 VIDEO OUTPUT
(V9) 6AQ5 SOUND OUTPUT
TM1028
S02
PL2
TO PIX TUBE DAG
SPKR
PL3
R170 470
R171 3900
R172 470
Y110A YOKE ASSEMBLY
4.5 MC SOUND
IN60
L12 .12 uH
L13 220 uH GREEN
L14 220 uH BROWN
L15 BLUE 300 uH
L16 47.25MC TRAP
(V10) 6CS6 SYNC SEP NOISE GATE
(V11) 12AU7A VERT. OSC
(V12) 6EM5 VERT. OUTPUT
TMB50
(V13) 12AU7A HORIZ OSC
(V14) 6DQ6B HORIZ OUTP
(V15) 6AX4 DAMPER
(V16) 1G3 H.V. RECT.
(V17)
H.V. ANODE 18KV
H.V. 18KV
TWF90
CONTRAST R137
BRIGHTNESS R141
VERT. BLANKING
AGC PULSE
VERT HOLD R159
VERTICAL LINEARITY R167
HEIGHT R162
HORIZ HOLD R188
HORIZ SYNC
B+ BOOST 620V
DUAL SELENIUM DIODE FEDERAL-K1615 RC-04 OR EQUIVALENT.
BOTTOM VIEW, PLUG-IN FLYBACK TRANSFORMER TWF90

Schematic Diagram Courtesy of Setchell-Carlson Inc.